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ECONOMIC PROBLEMS OF SIBERIAN DEVELOPMENT REVIEWED

Moscow EKONOMIKA I MATEMATICHESKIYE METODY in Russian No 5, Sept-Oct 79
pp 837-850

[Article by A. G. Aganbegyan: "Economic Problems of Development of Siberia"]

[Text] Siberia is playing an ever increasing role in the long-range development of the USSR economy. This was stressed by Comrade L. I. Brezhnev during his visit to Siberia and the Far East. In connection with this, the scientists of the Siberian Department of the USSR Academy of Sciences have been assigned important tasks pertaining to elaboration of the key problems of development of Siberia's productive resources.

An extensive Siberia program was drafted pursuant to the CPSU Central Committee Decree on the activities of the Siberian Department of the USSR Academy of Sciences issued in January 1977. This program pools research on approximately 30 basic problems pertaining to development of natural resources (oil and gas in Western Siberia, coal in the Kuzbass, Noril'sk ore), development of the major territorial-production complexes, utilization of water resources, environmental protection, etc. A coordinator was designated for each of these problems, appointed from the leading scientists of the Siberian Department of the USSR Academy of Sciences; coordination plans were drawn up consolidating the efforts of academy and branch scientific research organizations and higher educational institutions. Economists of the Siberian Department of the USSR Academy of Sciences are taking active part in this extensive program, and in particular the Institute of Economics and Organization of Industrial Production which, by decision of the Presidium of the Siberian Department, is to head up this research.

The Institute of Economics and Organization of Industrial Production of the Siberian Department of the USSR Academy of Sciences recently celebrated its 20th anniversary. It was established in 1958 at the initiative of Academician V. S. Nemchinov, who served as its first executive director. Prior to establishment of the IE i OPP [Institute of Economics and Organization of Industrial Production], only one doctor of economic sciences and approximately 30 candidates of sciences were working in Siberia (for the most part in departments of higher educational institutions), and there were also several small economics laboratories.

Under the direction of Corresponding Member of the USSR Academy of Sciences G. A. Prudenskiy, director of IE i OPP, a solid staff was soon assembled, which from the very outset concentrated efforts on economic research and the social problems of Siberia's development. At the present time the staff includes approximately 20 doctors of sciences and more than 100 candidates of sciences. The institute has divisions in Irkutsk, Krasnoyarsk, Tyumen', and laboratories in Kemerovo, Barnaul and Kyzyl.

An economics complex, if we may use this term, was established at the Novosibirsk scientific center. It contains, alongside the IE i OPP of the SO AN [Siberian Department of the Academy of Sciences] USSR, the department of economics at Novosibirsk University (approximately 450 students are enrolled in this department, majoring in the area of economic cybernetics, and approximately 60 graduate students enrolled in a joint graduate program with IE i OPP), a special Novosibirsk State University department of advanced studies for RSFSR top-echelon administrative officials, a self-supporting economics-mathematics laboratory of Novosibirsk State University (the former self-supporting subdivision of IE i OPP has now become an independent organization -- the Institute of Automated Systems of Planning and Management of the USSR Ministry of Instrument Making, Automation Equipment and Control Systems), as well as the journal EKO, with a circulation this year of 60,000. All this has made it possible substantially to expand capabilities to conduct extensive research on key problems pertaining to development of Siberia's economy and to improve dissemination of research results. IE i OPP SO AN USSR conducts much research in cooperation with KEPS [Permanent Commission for the Study of Natural Productive Resources of the USSR] of the Presidium of the USSR Academy of Sciences, SOPS [Council for the Study of Productive Resources] of USSR Gosplan, and TsENII [Central Scientific Research Institute of Economics] of RSFSR Gosplan, and also works in close cooperation with branch institutes and economics deparments of higher educational institutions.

Most research is concentrated on elaboration of conceptual questions pertaining to Siberia's future; national-economy, branch and territorial problems of Siberia's development in an economic, social, and scientific-technological respect are studied in a combined and interlinked manner. The Institute is conducting this research together with geological institutes, technical and biological institutes of the SO AN USSR. We should mention in particular the close coordination with the Institute of Mathematics of the SO AN USSR, and particularly its mathematics-economics division organized by Academician L. V. Kantorovich and the Computer Center of the SO AN USSR.

Preparation of extensive preplan reports on problems of Siberia's development extending into the long-range future constitutes the synthesizing result of research by IE i OPP. Such reports, which usually contain several volumes, are prepared by the Institute in cooperation with other organizations two to three years prior to the end of the current five-year plan and precede work on drafting long-range plans. They are discussed in detail at the all-union conferences which are regularly organized by the Institute. For example, a report on development of the USSR national economy for the period up to 1990 was discussed in 1972 at a conference held in the village of

Shushenskoye, and a report on problems of Siberia's development during the 10th Five-Year Plan was discussed at a conference in Bratsk in 1973.

We seek to ensure that such reports constitute input material and a handy reference aid for branch and design organizations, local planning commissions, ministries and agencies in their work on drafting five-year and long-range plans.

In addition to preparing synthesizing reports, the Institute performs detailed elaboration of certain key problems pertaining to development of Siberia's productive resources. During the last several years, for example, particular attention has been focused on creation of a scientific foundation for the comprehensive program of economic development of the BAM [Baikal-Amur Mainline] zone (the Institute is the base organization of the Scientific Council of the Academy of Sciences on Problems of BAM). Another example is the drafting of an extensive program of socioeconomic development of the Siberian village, under the direction of Corresponding Member of the USSR Academy of Sciences T. I. Zaslavskaya. In the process of working on the five-year plan and long-range development, the Institute submits many suggestions and proposals on concrete items to RSFSR central organizations, USSR Gosplan, the Committee on Science and Technology, plus other directive bodies.

We should like to say a few words about the specific features of conduct of scientific research by IE i OPP. As is known, our staff is of economics-mathematics specialization. The Institute's research schedule devotes considerable attention to elaboration of a system of economic-mathematical models for forecasting and long-range planning. As a matter of fact, the Institute's structure corresponds to the levels of elaboration of this system. One division, which consists of several sectors, deals with models of national economy levels; a second, larger division works on optimization models of development of individual branches and sectors and their interlinked groups; a third deals with modeling territorial systems. Finally, the Institute contains a special division of mathematical methods in economics and a Computer Center, which is equipped with third-generation computers and other computer hardware. These divisions are not purely methods divisions but rather content divisions in the sense that they deal not only and even not so much with elaboration of economic-mathematical models as with their utilization for long-range calculations, intrinsic analysis of these calculations, and study of the principal problems pertaining to their subject matter. Therefore research on problems of Siberia is conducted with the extensive employment of economic-mathematical models and methods, which are placed in the service of content analysis and productive resources development forecasts for this region. Incidentally, this also applies to the Division of Labor Resources, which also performs mathematical calculations on computers when processing mass sociological information, including information obtained from sociological surveys conducted by the Institute, primarily with the aid of methods of image recognition, factor analysis, and simulation models (see, for example, [1]).

In recent years the Institute's methodological and methods base has been broadened by incorporating the tools of economic-mathematical modeling into the methodology of systems analysis and the specific-program approach. Special projects have been conducted on this methodology, but most importantly, this is an attempt concretely to apply systems analysis and the specific-program approach to concrete investigations [2, 3].

In this area the task consists in transitioning in the near future from utilization of separate economic-mathematical models to mutually coordinated calculations on a system of models encompassing different levels (national economy, branch, region). At the same time it is becoming increasingly important to develop the methodology of systems analysis and the specific-program approach, of course applicable to the objects of our investigation. In connection with this, construction of a comprehensive method for elaboration of combined regional problems will be a major project of 1979-1980.

Another specific feature of the Institute's research on Siberia is the fact that it is conducted in close coordination with scientific research being conducted on individual problems pertaining to the long-range development of the economy of the USSR as a whole and that of the RSFSR. The Institute is taking active part in elaboration by the USSR Academy of Sciences and the Committee on Science and Technology of a comprehensive program of scientific and technological progress and its socioeconomic consequences into the long-range future.

Such an approach enables one to examine individual problems of development of Siberia's productive resources from a broad national standpoint and to trace the general trends characteristic of this country's economic development, as applied to Siberia, deepening and detailing these trends. This particularly applies to trends of intensification of societal production, acceleration of scientific and technological progress, and a shift in development of societal production to further boosting the living standards of the Soviet people [4].

And one last feature is an organic combination of research on the technical-economic problems of development of Siberia's productive resources with social research being conducted by the Institute's division of sociological problems of labor and social planning of labor resources, on a broad cooperative basis with other organizations. The Siberian Department of the Soviet Sociological Association is based at the Institute.

We shall now discuss some specific Siberian problems.

One root question is determination of trends in Siberia's economic development and its place in the nation's overall economic complex. The Institute is also extensively studying Siberia's retrospective development, is performing systems analysis of possible variants of this region's future with the aid of economic-mathematical calculations based on an optimal intersectorial interregional model, and is organizing special research on the efficiency of the Siberian complex from a national standpoint, the reproduction process in Siberia's economy, and the rates and proportions developing here [5].

In our opinion Siberia's future must always be examined on the broad historical background of implementation of party policy in the area of exploitation of the natural resources of this country's eastern regions. During the years of Soviet rule Siberia has developed at an accelerated pace and has become a highly-developed industrial-agrarian region. In 1912 Siberia's gross industrial output was estimated at 101 million rubles, that is, only about 1.5% of Russia's industrial output. Two thirds of all enterprises and four fifths of all workers were employed in mining gold and coal (Siberia was producing three fourths of Russia's gold and 2 million tons of coal). At that time the total generating capacity of Siberian electric power stations was 20,000 kilowatts; four metallurgical plants were producing 10,000 tons of pig iron. The most important of the other branches was the dairy products industry, which was producing 60,000 tons of high-quality creamery butter for export. Agriculture contributed 78% of combined industrial and agricultural output prior to the revolution; agriculture was low-productivity, and the grain harvest, which averaged 4.5 million tons annually, was less than is produced today by Altayskiy Kray alone. Thus Siberia was viewed as an agrarian hinterland, an "internal colony."

The first long-range plan under Soviet rule, GOELRO, mentioned the special significance of Siberia's resources and the extensive potential for developing industry here. In April 1918 V. I. Lenin proposed drafting a comprehensive plan for linking the iron ore of the Urals with the coal of the Kuznetsk Basin and drew intention to the importance of studying Siberia's hydroenergy resources. "Development of these natural resources with modern technology," wrote Vladimir Il'ich, "will provide a foundation for unprecedented advance of productive resources" (V. I. Lenin, "Poln. Sobr. Soch." [Complete Works], Vol 36, page 188).

Lenin's ideas of establishing a Urals-Kuznetsk Combine (UKK) found concrete embodiment in the 15 May 1930 decree of the Central Committee of the All-Union Communist Party (of Bolsheviks). It stated: "A vitally essential condition for rapid industrialization of this country is the establishment in the East of a second primary Soviet coal and metallurgical center, by utilizing the wealth of coal and ore reserves of the Urals and Siberia" ("KPSS v rezolyutsiyakh i resheniyakh s"yezdov, konferentsiy i plenumov TsK" [The CPSU in Resolutions and Decisions of Congresses, Conferences and Central Committee Plenums], Part I, Issue 7, Moscow, Gospolitizdat, 1953, page 587).

The program for establishment of the UKK was a comprehensive and multipurpose plan and was not limited to the coal industry and metallurgy. It included construction facilities, mining and heavy machine building, by-product coke industry, iron-ore mining, establishment of new towns, and of course development of light industry and the food processing industry, specialized agriculture, etc. The planning concept was a broad one: "The Ural-Kuznetsk Combine," stated V. V. Kuybyshev, "will become the second center of our industry and of our national economy" [6]. In actual fact this was an interregional territorial-production complex.

Of considerab' interest in connection with this is the analysis of the master plan for development of Siberia's economy undertaken by IE i OPP, the first version of which was drafted in 1926-1927, and the second at the beginning of the 1930's. We discovered a bibliographic rarity, a copy signed by Comrade Eykhe, in the archives of the Novosibirsk Planning Commission. One can see from this document the comprehensiveness of the program to establish the UKK. In addition, resources and assets were concentrated here: 44% of all industrial capital investment in Western Siberia in the First Five-Year Plan was channeled into the Siberian portion of the UKK. And only 3 years after approval of the plans for the Kuznetsk Metallurgical Combine (KMK), its first blast furnace was fired up (April 1932), a second blast furnace that same year, plus construction of open-hearth furnaces and a rail mill, and at the end of 1932 the metallurgical cycle was closed (one year before Magnitka). The overall output of Siberia's large-scale industry increased ninefold, that of the USSR -- 5.4-fold, while Siberia's share of the nation's total production doubled.

Siberian machine building began to develop on the foundation of Siberian metal from the end of the Second Five-Year Plan and particularly in the Third. Of fundamental importance was the resolution of the 18th Congress of the All-Union Communist Party (of Bolsheviks) to establish in the East counterpart enterprises of a number of machine building branches: in Siberia -- turbine engineering, machine tool engineering, etc. Before the war 17% of Siberia's total production was in machine building and metalworking.

The party's policy of industrializing Siberia was fully borne out during the harsh years of the Great Patriotic War. A powerful Soviet military-industrial base was established in Western Siberia. Of all the industrial enterprises relocated from the west in July-November 1941, 244 were sited in Western Siberia, and 78 in Eastern Siberia. By 1942 evacuated plants were producing 40% of Novosibirsk's total gross output; production of military goods in Western Siberia, according to figures by A. N. Voznesenskiy, had increased 27-fold over 1940. An aircraft, tank, and ball-bearing industry was established here. Machine building experienced particular growth and development.

A new stage in development of Siberia's natural resources began after the war. The Angara-Yenisey program for establishment of energy-industrial complexes was the principal project. Enormous scientific work on substantiation of this program was performed by the Angara-Yenisey office of the USSR Academy of Sciences and Gidroproyekt. This is a bright page in the chronicle of Siberia's development. IE i OPP published a book entitled "Problemy territorial'noy organizatsii proizvoditel'nykh sil Sibiri" [Problems of Territorial Organization of Siberia's Productive Resources] (Nauka, 1971). which acquainted the public with the ideas of Angarstroy and previously-unpublished writings of one of the authors of this project -- N. N. Kolosovskiy.

The war postponed implementation of the Angara-Yenisey program. The Irkutsk Hydroelectric Power Station, the first component of this program, came online in the mid-1950's, and since that time vast projects have been in progress to build energy and industrial complexes in Krasnoyarskiy Kray and Irkutskaya Oblast. The Irkutsk-Cheremkhovo Territorial-Production Complex

(TPK) and the Central Krasnoyarsk TPK were established, followed by the Bratsk-Ust'-Ilimsk TPK in the 1960's and 1970's. In the northern part of the Angara-Yenisey region, the Northern Yenisey TPK, centered at Noril'sk, is growing rapidly. Construction of the Sayan TPK in the southern part of Krasnoyarskiy Kray has been in progress in the 10th Five-Year Plan, and the Boguchanskaya GES is the firstling of the future Lower Angara TPK. Work has begun on development of the country's largest fuel-energy complex, the Kansk-Achinsk (KATEK), located in Krasnoyarskiy Kray and the eastern part of Kemerovskaya Oblast. This was promoted by preparatory work done before the war -- by the Angara-Yenisey Office, and after the war -- by extensive research on the development prospects of the Angara-Yenisey region [5, 7].

The first East Siberian conference on the study of productive resources was held in 1947; this conference synthesized past work and specified prospects for development of the natural resources of Eastern Siberia. The conference was held under the direction of academicians V. A. Obruchev, A. Ye. Fersman, I. P. Bardin, V. S. Nemchinov, and others. A second conference was held in Irkutsk in 1958, which scientifically substantiated new tasks. An All-Union Conference on Problems of Development of Siberia's productive resources was held in 1969 at Novosibirsk's Akademgorodok, which summarized the current development status and designated directions and areas of future work both on the Angara-Yenisey and other Siberian programs.

A new stage of development began with exploitation of the oil and gas fields of Western Siberia. The nation's principal fuel-energy base was established here in an extremely short period of time. The first million tons of crude oil were produced in Western Siberia in 1965, while 31 million tons were produced in 1970 and 148 million tons in 1975; a production volume of 315 million tons is anticipated for 1980; the first billion cubic meters of natural gas were produced in 1964, 38 billion in 1975, with an expected production of 155 billion cubic meters in 1980. No other country in the world has had such a rapid pace of development of oil and gas resources.

A new, fourth major program for development of Siberia's productive resources began in the 10th Five-Year Plan -- construction of the Baikal-Amur Mainline and economic development of its zone. Up to the present time 1,500 km of railbed has been laid of the total 3,600 km of rail line on the "big" (east-west) and "little" BAM (BAM-Tynda-Berkakit Line). BAM is scheduled to go into operation in the next five-year plan as a through main rail line, and work is already in progress to develop this country's new industrial belt covering a vast territory of more than 1 million square kilometers -- the BAM zone. The first facility of its economic exploitation -- the Neryungrinskiy strip coal mine -- shipped out its first loaded coal consist in November 1978.

This brief retrospective review of the development of Siberia's economy clearly shows the policy of the Communist Party and Soviet state in the area of development of the natural resources of the eastern regions. First of all we should note the broad strategic view, inherent in this policy, of effectiveness and efficiency of development of Siberia's natural resources. This policy is connected not only and even not so much with obtaining near-term

economic benefit and accomplishment of tactical tasks as it is directed at solving the root problems of development of this nation's economy into the long-range future, taking into account the major economic, social and political demands. G. M. Krzhizhanovskiy, who headed this country's Gosplan during its early years, articulated well this party position: "It sometimes happens that local officials, advancing a local problem and defending local needs, will engage in a little boasting. But there is no need for concern in this regard when Siberia speaks of its resources, for the question of Siberia's mineral wealth and utilization of these resources is not a question of national scale for the USSR but rather a question of world significance. There are no elements of philistine boasting here. One must consider Siberia's development prospects as a position in the world struggle, and any resistance they begin to offer under the banner of profitability of calculations for today and on the basis of of today's political and economic conditions is a direct reminder of what power game we are involved in" [8].

A characteristic feature of the party's economic policy in respect to Siberia's productive resources is implementation of national development programs for individual regions of Siberia and the formation of territorial-production complexes. This policy stands in opposition to the policy line of locating in Siberia diversified enterprises of different branches of industry which are not interlinked. The main direction of Siberia's socio-economic development lies in establishing an interlinked group of branches together with a production and social infrastructure, construction of new cities and towns, preparation of conditions for attracting and holding population in the new regions, and raising toiler living standards.

National programs for development of Siberia's productive resources are drawn up utilizing the methods of systems analysis and economic-mathematical modeling, with extensive utilization of the results of sociological studies. IE i OPP, in conformity with the demands of systems analysis, has undertaken attempts to construct several scenarios of Siberia's future development and to perform an elaborate situation analysis of several economic development variants. The quantitative indices of these variants were determined with the aid of an optimal intersectorial interregional model. This is discussed in detail in an article by project supervisor A. G. Granberg, and therefore I shall merely mention the most important result of these calculations, namely the necessity of ensuring in the future a more rapid growth of societal production in Siberia in comparison with the economic development of other parts of the country. The growth rate of Siberia's economy, from the standpoint of the national economy as a whole, should over the long-range future be 20-40% higher than the national growth rate. For example, with an average annual societal production increase of 5% for the USSR as a whole, societal product in Siberia should increase 6-7% annually. In like manner, if the country's potential industrial product growth averages 6% annually, Siberia's should average 7.5-8.5%.

In the last 10 years the rate of economic development in Siberia has been higher than that of the nation as a whole. In 1966-1975 industrial output in the USSR increased each year approximately 8% on the average, and almost 9% in Siberia. It is obvious from the standpoint of long-range calculations

that this lead is insufficient to ensure optimal economic development of the entire country. The necessity of a higher growth rate is connected in the first place with the high economic effectiveness of development of Siberia's natural resources.

One frequently hears the view that development of Siberia requires greater outlays and is characterized by a low rate of repayment of investment, since it is more expensive to build in Siberia, labor must be paid more, and the cost of building an infrastructure is high in new regions, and also that transportation costs are high due to the considerable distances involved. Only one aspect of the matter -- costs -- is stressed in these arguments. Indeed, costs are higher per unit of work performed in Siberia, especially in the northern areas.

Another and no less important aspect is the results achieved in developing Siberia's natural resources. But they prove to be greater. This is connected primarily with geologic conditions favoring production (greater well flow in the oil industry, thicker seams close to the surface in the coal industry, higher-grade ores in nonferrous metallurgy, better quality of timber and high concentration per hectare in the logging industry, etc). Also of importance is the fact that natural resources in Western and Eastern Siberia are a rule highly concentrated -- oil and gas fields, vast reserves of coking coal in the Kuznetsk Basin and power coal in the Kansk-Achinsk Basin, and immense timber resources. Siberia contains three fourths of the nation's fuel-energy resources and more than half of this country's hydropower resources, commercial timber, and various nonferrous metals. A high concentration of natural resources offers the opportunity to build very large enterprises with facilities of unprecedented production capacity, and to employ the most modern, custom-built equipment; this reduces production costs. In the Kansk-Achinsk Basin Berezovki Strip Mine I is being developed -- with a production capacity of 55 million tons, utilizing the most sophisticated continuous-operation excavators. This coal will fuel power generating plants which are also of unprecedented generating capacity -- 6.4 megawatts, with a turbine unit output of 800,000 kilowatts, and of course the country's cheapest electricity.

Here is another example -- the Tobol'sk Petrochemical Combine, fed by the vast raw materials of the oil and gas fields of Western Siberia. The unit capacity of its facilities is from double to triple that of today's flagship of the Soviet petriochemical industry, for example—the Nizhne-Kamsk Combine. A higher level of labor productivity will be achieved, and product will be cheaper. Huge capacities are also being put on-line at Siberia's hydroelectric power stations, at forest products industry complexes, mining and ore beneficiation combines, nonferrous metallurgical plants, aluminum plants, etc.

The energy component is occupying an ever increasing position in aggregate costs of production. In Siberia a ton of standard fuel costs roughly 10 rubles less than in other parts of the country; this region contains the cheapest electricity, and therefore the costs of producing energy-intensive and heat-intensive product in Siberia are the country's lowest.

Society is channeling increasingly greater capital investment on supplying industry with water, as well as on wastewater treatment. Wherever water resources are inadequate, it is necessary to build costly canals, dam rivers, etc. Siberia is better supplied with these resources than other regions: annual river flow totals 2,000 cubic kilometers (for comparison, the annual flow of the rivers of Central Asia and Southern Kazakhstan, with a population greater than that of Siberia, is 137 km^3).

These factors much more than make up for the higher construction costs, higher costs of attracting and holding a labor force, development of an infrastructure, and transport costs. As a result, in spite of somewhat longer construction schedules in comparison with more heavily-populated regions, investment payback is the country's fastest. In Western Siberia, for example, 1.7 billion tons of hydrocarbons (converted to crude oil) will be extracted during the 10th Five-Year Plan. Considering crude oil prices on the world market (70-80 rubles per ton) and the internal efficiency of hydrocarbons, aggregate savings for the nation's economy from development of Western Siberia's oil and gas resources will total at least 150 billion rubles during this five-year period. Total costs of development of this region's productive resources, even including expenditures on construction in progress, will total approximately 25 billion rubles for that same period; overall current expenditures are even less. Calculations indicate that payback of capital investment on development of the Western Siberian Oil and Gas Complex is extremely rapid -- several times the rate of national figures.

No less startling figures could be cited on efficiency of development of Siberian hydroelectric power, aluminum industry, and other energy-intensive industries. The branches of Siberia's forest products industry complex are characterized by a high degree of effectiveness. In particular, calculated expenditures on timber cutting and producing lumber are several times lower than the prices for these products on the world market. We also know that Kuznetsk coal has specific capital costs and production cost which are much lower than that of the coking coal of the Donbass and other coal fields; consumption of this coal is economically more advantageous even in this country's central regions, to which the bulk of production goes. It is characteristic that new underground and strip mines in the Kuznetsk Basin offer even more favorable geological conditions for production. A vivid example -- the most recent underground mine put into production in the Kuzbass -- is the Raspadskaya mine, where a very low coal production cost and the highest labor productivity have been achieved.

Also exaggerated is the view that greater additional outlays are required to support a population in the areas of Siberia, for a large part of Siberia, which contains the bulk of the population, offers favorable natural and climatic conditions, with a healthy climate. These are the areas in the central and southern parts of Siberia. Applied in these areas is a regional wage factor of 1.15 in Western Siberia and 1.20 in Eastern Siberia, while the cost of building housing and service facilities is only 10-15% greater than in the European part of the country. In addition, it costs somewhat less on the whole in comparison with national figures to provide the

population with foodstuffs. Siberia contains 20% of the country's agricultural land, and in most instances this is fertile soil. One farm worker in Siberia produces on the average half again as much as the national average. Overall costs of producing grain, potatoes, milk, meat, and eggs in Siberia are equal to or below the national average. Siberia is fully self-sufficient in principal foodstuffs, except for sugar, fruits and vegetables. Siberia produces 8% of the nation's total agricultural output, with a population, including the northern areas, which is also 8% of the national total.

Of all parts of the country Siberia perhaps possesses the greatest potential for substantially increasing effectiveness of agricultural production. This is connected with the fact that intensification of agriculture is lowest in this region. Only one fifth as much fertilizer is applied per hectare in Siberia as the figure for the USSR as a whole. Grain and fodder crops are produced practically without fertilizer. Siberia's agriculture, especially livestock raising, is relatively more poorly equipped with machinery, and the comparative industrial base growth index for the village, including feed production and processing of agricultural products, is lower.

At the present time the greatest efforts are being directed toward boosting agricultural production in the nation's Non-Chernozem zone. This is absolutely correct and efficient from the standpoint of the nation as a whole. However, after carrying out the large-scale program of development of the Non-Chernozem zone it would be advisable in our opinion to proceed with the building of a highly-developed agrarian-industrial complex in Siberia. But potential here is truly inexhaustible. Mass-scale experiments have demonstrated that even a small quantity of phosphate fertilizer applied to grain crops can boost Siberian yields from 50 to 100%. Irrigation is highly effective in a number of areas, especially on the famous Kulunda Steppes. Payback of such expenditures is almost twice as fast as specified by the standard method for effectiveness of capital investment.

Of all the problems connected with the future development of Siberia, in our opinion the following are of the greatest significance.

The technological base is extremely important for development of Siberia's natural resources under conditions of the scientific and technological revolution. The specific features of these resources demand implementation of a regional scientific and technical policy. The standard equipment employed in other regions fails to provide more efficiency in Siberia, and special equipment is required in the northern areas. Due to the lack of such equipment, annual additional costs connected with repair and forced down-time just of trucks and tractors exceed 0.5 billion rubles. Larger equipment is needed for Siberian mining operations and construction projects. Due to the lack of roads, Siberia has an acute need for vehicles with off-road capability, including air-cushion vehicles.

The availability of cheap electric power makes the development of electricity-using technologies advantageous in many branches, for which new industrial processes should be developed. The combined character of many

mineral resources also demands development of specific technologies for them, utilizing not only the principal components, but also additional useful components contained in the ores.

The entire country is helping develop Siberia's wealth of natural resources. The region also possesses a highly-developed machine building industry. But its historically-developed specialization is such that three fourths of the machinery and equipment manufactured here are hauled elsewhere, primarily to the European areas, while approximately three fourths of Siberia's own machinery and equipment needs are met with equipment hauled in from elsewhere. These figures show how critical is the problem of respecialization of Siberia's machine building industry -- with primary emphasis on building the technical means for developing its own natural resources. First of all, there should be organized in Siberia manufacture of non-standard, custom equipment with considerable metal requirements and with relatively low labor requirements in manufacture. Much has been done in this regard in recent years. A complex of 12 electrical equipment industry enterprices is being built in Minusinsk, focused toward Siberian needs. The first shops have gone into operation at a very large plant in Abakan for producing large freight cars and containers, designated primarily for hauling in the eastern regions of this country. Production of large trailers has begun in Sosnovoborsk (Krasnoyarskiy Kray); these trailers are for use primarily with KAMAZ trucks delivered to Siberia and the Far East; a large trailer plant is being built. The country's largest plant for the production of large excavators is under construction at Krasnoyarsk (it is called a second Uralmash). Its production will go primarily toward development of the Kansk-Achinsk coal fields. Plans also call for construction in Siberia of very large complexes for the production of oil and gas equipment and plants for the manufacture of mining equipment for underground mining operations, boilers for giant thermal electric power plants, etc.

Unquestionably there will be built in time large enterprises in Siberia which will produce large trucks, for the most part in an arctic model, and construction equipment which is in such great need in Siberia. Mass production will be established for an aggregate of equipment for fully mechanizing logging operations, on which hundreds of thousands of workers are still doing manual labor, and means of mechanization for livestock raising, which in Siberia is an all-union specialization branch, since Siberia supplies meat and dairy products to many parts of the country.

At the same time some machine building plants already in existence in Siberia must be respecialized. Novosibirsk, for example, contains the country's largest Sibelektroterm Association, which manufactures thermal electric generating plant equipment. Up to the present time this association has been shipping the bulk of its output to other parts of the country, and this situation was a consequence of the fact that power-intensive plants are still developing at an inadequate pace in the Siberian areas. This particularly applies to the manufacture of electric furnace steel, which has simply not been developed in Siberia. Construction is beginning on an electric furnace steelmaking shop at KMK, and on the agenda is construction of an electric furnace steelmaking and ferroalloy production

facility at the Western Siberian Metallurgical Combine. There is no doubt that in time Siberia's needs will require construction of a very large electrometallurgical combine. In the long-range future there will occur extensive development in Siberia of an electric power-intensive process of direct ore reduction -- metallurgy without blast furnace. In the future the output of Sibelektroterm will be directed to an increasing degree toward Siberian needs.

Development of many other branches of the chemical industry has great prospects, particularly energy-intensive chemical industry, including organic synthesis. At the present time Siberia is producing only one tenth of the country's chemical output, but there has already occurred a shift to more rapid development of this most important branch. The country's largest petrochemical combine is under construction in Tobol'sk, plus a chemical combine in Tomsk, a plastics plant in Omsk, and chemical industry facilities are being considerably expanded in Siberia's traditional chemical industry center -- Irkutskaya Oblast. All this, however, is just a beginning. In view of these trends, it is advisable to start examining the question of establishing in Siberia a large machine building base for the manufacture of chemical equipment, particularly since this branch is inadequately developed in the country as a whole.

Speaking of a technical base for development of natural resources in Siberia, we must particularly emphasize the ever increasing role of construction. With specific climatic conditions and great distances, it is especially important to develop industrial methods of construction, chiefly with utilization of light structures and transition to fully prefabricated, primarily fully modular construction. Rapid growth in transport construction capabilities is also extremely important for Siberia.

Much has been done in these areas. The large Sibkomplektomontazh Association has been established in Tyumenskaya Oblast, producing modular construction units with which, just like play blocks, numerous industrial facilities are rapidly erected for development of oil and gas fields. There is a trend toward increasing the size of modular units. This will make it possible within the next few years to shift to industrial construction in developing oilfield facilities, with all-modular facilities, and it will be possible finally to resolve the problem of building gas-pumping and crude oil-pumping stations on a modular basis. Unfortunately this Tyumen' experiment is not yet being adopted very extensively in other development areas, particularly in Eastern Siberia, in construction of BAM, and in the Far East.

A process has been developed in Krasnoyarsk for the assembly-line erection of industrial buildings of precast elements and lightweight structures. This technique was employed to erect in a period of 5 months a gigantic shop of 80,000 square meters for the Krasnoyarsk Industrial Building Structures Combine. If this method is disseminated throughout Siberia, construction time could be reduced severalfold, and in addition, construction worker labor productivity would increase fourfold (as on the Krasnoyarsk job).

Appreciable changes, particularly in connection with construction of the Baikal-Amur Mainline, have also taken place in transport construction. A 100,000 man work force of transport construction workers has been established on BAM in a period of 2-3 years, employing modern equipment and capable of "moving mountains," as they put it. No other transport construction project in the nation's history has progressed so rapidly, and this inspires the hope that in the future the transport development of Siberia will become greatly accelerated, for BAM is only part of the future Northern Siberian Mainline, its eastern section. There is already being felt an acute need for a new transport artery from Europe to Siberia. This Northern Trans-Siberian Railroad, with increased traffic capacity, will make it possible fundamentally to improve transport links between Siberia and the European part of our country, and at the same time to es ablish a new zone of industrial development of the Near North.

The problem of development of the Far North is also being resolved in a totally new manner. Following the historic voyages of the nuclear-powered icebreakers "Lenin," "Siberia," and "Arctic," presently on the agenda is organization of year-round shipping by the Northern Sea Route, which will expand capabilities to develop the natural resources of the Siberian North.

Siberia's infrastructure would be incomplete without construction of an elaborate network of modern highways, primarily in already-developed areas, including agricultural regions. At present construction of highways in Siberia is proceeding at a patently insufficient pace, but we hope that in time the experience and know-how of BAM will also be adopted.

Of course the technical foundation for development and the infrastructure are basic items. As they say, "Siberia cannot be taken with bare hands." But even more important, in Siberia man is the main productive resource. Man's role is sharply increasing under present-day conditions, for he is the creator and user of modern equipment. The scientific-technological and professional level of cadres determines to a decisive measure success in development of Siberia's productive resources. Therefore attracting and holding manpower and creation of the entire aggregate of living conditions is the most important problem we face. A large team of economists and sociologists is working at IE i OPP specifically on this proble . truly a great deal remains to be done in this area.

In recent years party and government have devoted particular attention toward improving life in Siberia. Several years ago the regional wage factor was extended to all branches, northern benefits were increased, certain areas were designated as higher-wage areas, housing and services construction expanded, and new universities, other higher educational institutions and secondary technical schools were established. Large-scale social measures to raise the living standard of the Soviet people are being carried out primarily in the eastern and northern ares. All this has greatly altered the situation. In the past, up to 1974-1975, Siberia had a negative migration balance, that is, more were leaving than arriving, while in the last 5 years this migration balance has become positive. The labor pool in the new development areas has grown particularly rapidly. Since 1965 approximately half a million persons have been attracted to the Western

Siberian oil and gas region, approximately 300,000 persons have been drawn to construction of the Baikal-Amur Mainline and into its economic development zone in the last 5 years, etc. It is very important that primarily skilled workers and relatively young workers come to Siberia. Komsomol appeals have played an important role in this regard. In particular, Komsomol-youth detachments have comprised almost one third of the total work force of Glavbamstroy. The duty-watch method was first employed on a large scale in developing the oilfields of Western Siberia: drilling crews fly from the Volga to jobs along the middle Ob'.

We shall note that in development of Siberia's productive resources planners are counting primarily on the local population and on increasing labor productivity. More than three fourths of societal production growth in Siberia is achieved by increasing labor productivity, while only one fourth is by increasing the work force. The natural population growth in Siberia is primarily from the comparatively young population and is somewhat higher than in the Urals and European part of the country. And in the long-range future as well we do not envisage the migration of many millions of persons to Siberia; what are needed here primarily are highly-skilled workers and specialists, especially in those new branches of production which are being established. The main thing is to increase labor productivity and hold the population which is already here.

Social factors have in recent years been playing an ever increasing role among the factors in increasing labor productivity. One can trace a strong feedback between concern for man, his working and living conditions and educational level on the one hand and his labor performance on the other. In this regard there are a number of negative trends occurring in Siberia. The labor force turnover rate here is approximately half again as high as, for example, in the European part of the country; it is particularly high in construction. A large percentage of persons terminating employment leave for other regions, and they are replaced by new arrivals, who require an extended period of time to become familiarized with the specific conditions of Siberia. The country sustains enormous losses due to an excessive labor turnover, losses which in Siberia run into hundreds of millions of rubles each year. Therefore creation of conditions for holding manpower here is not simply of social significance but is also a highly-effective measure for achieving the requisite production indices. The importance of this problem is increasing sharply in connection with the fact that in the next five-year plan the incremental growth of this country's able-bodied population will decrease substantially due to the demographic consequences of the war.

At the present time the average wage level in Siberia is only 14% above average worker and employee wages for the RSFSR as a whole. In other words, the regional factor established for Siberia is not yet working in full measure, and therefore the elevated budget which is needed here is not yet being materially reinforced in full measure. The point is not to boost the regional factor but primarily to establish in Siberia a requisite wage level which is in conformity with the existing factor.

It is even more important to ensure in Siberia that the growing personal cash income is balanced off by the requisite mix of foodstuffs and manufactured goods. At the present time goods turnover per capita in Siberia is somewhat lower than the average for the republic as a whole.

And the most important thing for holding the labor force is housing and social-services conditions. For historical reasons, housing availability in Siberia averages 10-20% less than in the European part of the country, with relatively worse quality of housing. There is even a greater lag in the area of personal services, health care, children's preschool facilities, retail merchandising and public dining. In recent years more and more funds have been allocated for housing and social-services construction, but a portion of these funds is not being utilized, while another portion is being utilized but with a substantial overrun over estimated cost, primarily due to the fact that in the preceding period work on expanding the housing and social-services construction base was neglected. Therefore we believe that a vital problem in these coming years will be solution of the problem of achieving a substantial broadening of the construction base in Siberia.

Our calculations indicate, however, that by utilizing Siberian resources alone the problem of establishing here at first a comparable and subsequently a superior level of housing availability will take too long to resolve, and yet each and every year counts. Therefore for certain parts of Siberia, and particularly new-development areas, it would be advisable to organize, following the example of BAM, patronage by other, settled parts of the country in order simultaneously to expand the construction base in Siberia and additionally to build housing and social-cultural services facilities. This applies first and foremost to the areas of the Western Siberian oil and gas complex, where the most difficult situation prevails as regards housing and services, with one contributing element the fact that the corresponding ministries, with the consent of local officials, have been implementing a slogan -- the main thing is oil, and then everything else. Unfortunately this viewpoint, which in our opinion is faulty, has many supporters. They are sincerely convinced that first production must be obtained, production outlays recouped, with housing and services later to be built from the obtained savings. In actual fact such an approach costs the state much more, because in the initial period of construction of production facilities and their operation, construction costs increase due to a higher rate of labor turnover and the impossibility of setting up work operations on several shifts due to a shortage of workers; there is also underutilization of production facilities on-stream, not to mention enormous social losses. In our opinion those officials are proceeding correctly who show priority concern for housing and worker services and, having created favorable living conditions and having established a permanent work force, rapidly place new production facilities on stream and soon have them producing at full capacity.

There are many economic and social problems of Siberian development. Much has been accomplished. Siberia has been transformed into a highly-developed industrial region, which has made a large contribution to this country's economy. M. Lomonosov's prophetic statement has come true: "Russia's might will be increased by Siberia." And there is no doubt that this contribution

by Siberia toward building the material and technological foundation of communism will increase in the future.

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EXPENDITURES USED IN EVALUATING RESOURCES AND INTENSIFYING PRODUCTION

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[Article by Yu. V. Yakovets, professor, doctor of economic sciences, and head of the department of the USSR Academy of the National Economy, Moscow: "Intensification of Production and Evaluation of Resources"]

[Text] This is not the first time that this journal has devoted its pages to a discussion of individual aspects of the problem of price formation and the economic evaluation of the products of labor and natural resources*. This time the attention of the reader is directed to an article in which these questions are combined with a system of views on the theory of the intensification of production and planned prices.

The article, of course, presents the author's point of view, which is, to a great degree original and sometimes questionable -- with respect to, let us say, payments for capital -- but, without a doubt, topical, capable, as it seems to us, of evoking the animated interest of the reader in one of the most urgent problems of contemporary economic science and the practice of planning.

In scientific elaborations and practical steps for improving the planned management of economic activities emphasis is now being transferred to the development of an overall economic mechanism of the intensification of

* See, for example, Ye. G. Yefimova, "Payment for Production Funds and the Effectiveness of Their Utilization," EKO, No 4, 1973; A. G. Zav'yalkov, "Costs for Reproduction of Labor Force," EKO, No 4, 1974; V. L. Perlamutrov, L. B. Braginskiy, "Credit-Finance Levers of Economic Interest and the Economic Mechanism," EKO, No 1, 1975; V. A. Volkonskiy, "Economic Interests and the Economic Mechanism," EKO, No 1, 1977; N. P. Bannyy, D. D. Moskvin, A. A. Fedotov, "Economic Evaluation of Secondary Resources," EKO, No 3, 1978.

production and the most important aspect of the whole economic mechanism. Centralized planning serves as the pivot of the whole mechanism of intensification. The plan, however, works effectively only in a close unity with the system of economic incentives and stimulants, in which the planned price occupies a conspicuous place. Its role in the mechanism of intensification can be outlined by three basic borders.

The intensification of production manifests itself in the careful expenditure of resources per unit of final products, in other words, in the reduction of labor-intensiveness, capital-output, material-intensiveness, and the requirement for the natural resources of the national income. In order to compare the expenditures of resources and the final results of production on a scale of the whole national income as well as in each sector, territorial unit, association, and enterprise, it is necessary to have generalizing indexes and evaluations which will make it possible to reduce resources of varying kinds and quality and the millions of varieties of products to a common denominator. Labor expenditures -- live and embodied -- serve as such a common denominator. For all the imperfections of active prices which are frequently and correctly subjected to criticism, there is no other universal representative of the expenditure of live and embodied labor, which is embodied in the resources being used and the manufactured product.

Therefore, price appears as one of the instruments for measuring intensification -- its rates, results. In this role price works not outside of the plan, but within it, serves as the basis for constructing planned evaluations, and working out optimal planned decisions and as a means of control over their effectiveness and implementation.

Also price serves as a guideline for centralized planned decisions in the area of intensification of production.

In the overall state plan it is possible to provide for only the basic proportions balanced with the resources of the task for producing several thousand of the most important types of products. In reality, there are three more orders -- approximately 12 million designations, and for an uninterrupted reproduction it is necessary to supply each consumer with resources of the proper quality -- with products of the labor of others -- necessary to him on time.

The overall success of the intensification of production can be achieved only under the condition that each production collective is equipped with the criteriaand standards for an economic evaluation of the resources being used and the products being manufactured and for a comparison of expenditures with their results. The cost indexes produced from prices (the productivity of labor, output-capital, material-intensiveness, profitability of production, and so on) serve as such criteria and standards.

The speed of the processes of the intensification of production to a significant degree depends on the degree to which its goals are connected with the economic interests of the labor collectives and workers and reinforced by the incentive system and personal financial interest. Prices also serve as a "bridge" from the plan to the economic incentives; with their help it is possible to evaluate the work results of collectives with autonomous financing and to determine the dimensions of the incentive funds, the variable portion of a worker's earnings.

A planned management of the intensification of production is not possible without a deliberate application of planned prices. The tasks of intensification present demanding requirements on price formation, impel us to take a new approach to many theoretical and practical questions of the formation and utilization of prices -- for the evaluation of productive resources as well as for a comparison of expenditures with the obtained results and for the economic stimulation of labor collectives.

Prices and the Economic Evaluation of Resources

The rational utilization of production resources presupposes two interdependent systems for their evaluation. First of all, it is necessary to know what a unit of resource costs society, the quantity of social labor embodied in it, and what is the cost of the reproduction of a resource; in the second place, it is necessary to know how to quantitatively determine the effect from the consumption of resources of differing qualities, their use value.

Inasmuch as it is a question of the cost of resources, the following circumstances are important. The moment of the creation or the appearance of the resource -- the construction of a building or an installation, the discovery of a deposit of valuable minerals, the planting of a forest -- and the moment of the beginning of its exploitation can be separated by a significant amount of time, measured in years, and sometimes in decades. Therefore, it becomes necessary to reduce resources to a unified cost evaluation at the moment of their consumption. The cost of resources changes according to various trends and at varying rates. For example, computer equipment and instruments which are already in use lose a portion of their cost over a period of time because of obsolescence since the prices of analogous equipment being newly manufactured rapidly decrease. At the same time the cost of mineral, forest, and agricultural resources displays a long-term tendency to increase.

Moreover, it is important to consider the peculiarities of the reproduction cycle of each resource. As applied to the resources of current material expenditures (raw material, materials, fuel, energy) this cycle is the shortest, the difference between actual expenditures of labor and the cost of their reproduction is minimal, close to zero. Fixed productive capital, especially buildings and installations, are used for a much greater length of time, the gap between their nominal and real cost evaluation grows; this gap is overcome with the help of systematic reevaluations of fixed capital.

The last such reevaluation with respect to this status was conducted on 1 January 1972. The time factor has an even greater effect on the cost evaluation of mineral and forest resources.

Only one evaluation of expenditures for the reproduction of resources is insufficient for their optimal distribution and rational utilization. Resources are not identical with respect to their use value, consumption effectiveness; however, the overall economic evaluation of the consumer properties of resources can also be obtained in a cost form. For this, a comparison is made of the combined expenditures of social labor per unit of product produced with resources of varying quality. Such an evaluation bears a differential nature, serves as an exponent of the differences of the use value of resources (but the consumers have the decisive word in evaluating the effectiveness of the utilization of the resources and their quality). The combining of these two systems of evaluation makes it possible to achieve a maximum satisfaction of the needs of society for resources with minimal expenditures for their reproduction.

System of Prices in Need of Improvement

It must be said, serious distortions exist in the cost evaluation of resources, which have a negative effect on the effectiveness of their utilization and slows down the process of the intensification of production. The evaluation of the more deficit primary resources -- labor and natural -- for example, turned out to be understated.

The evaluation of expenditures for the reproduction of labor resources possesses a special specific character. Inasmuch as the labor force, which is not a commodity under socialism, is not sold and is not bought and, consequently, does not have a value, the term "cost of reproduction" is hardly applicable to labor resources. However, the conclusion to refuse to measure socially necessary expenditures for the reproduction of labor resources would hardly be correct. The reproduction costs of the labor force are increasing, which is expressed in the increase of the average wage as well as of payments from the social consumption fund going out to each employed individual. Thus from 1960 through 1978 the average monthly wage of blue-collar and white-collar workers almost doubled; payments and privileges from the social consumption fund increased by 117 percent per worker.

In the draft calculations and in the practice of profit and loss accounting the economical expenditure of labor resources is evaluated according to the sum of the wage and deductions for social insurance. However, the monetary wage in 1978 amounted to only 73 percent of the expenditures for the reproduction of the labor force on the average for blue-collar and white-collar workers. This tendency will manifest itself more distinctly in proportion to the increase in the role of the social consumption fund in satisfying the needs of workers and their family members. With the introduction of the payment for funds the relative underestimation of the profit and loss evaluation of labor resources in comparison with the equipment replacing them increased, which narrows the economic limits of the application of machinery,

minimizes the effect of the overall mechanization of labor-intensive processes.

In a theoretical example an automated production line valued at 1 million rubles with a service life of 10 years makes it possible to free 40 workers with an annual wage of 2,064 rubles each and, consequently, provide for an annual savings in wages of 82,560 rubles, and a total savings of 88,340 rubles including deductions for social insurance (7 percent of the wage fund). From the point of view of the profit and loss interest of an enterprise such an automated production line is not advantageous since it will result in an increase in the prime cost by 11,660 rubles and in a reduction of the calculated profit by 71,660 rubles (after the deduction of payments for funds at a rate of 6 percent). Taking the social consumption fund into account expenditures for the reproduction of the working force will amount to 2,832 rubles for each worker annually. Therefore, in fact the implementation of an automated production line would bring an annual savings of 13,240 rubles and would free deficit labor resources for society.

The underestimation of the profit and loss evaluation of labor resources is one of the reasons for the decelerated mechanization of labor-intensive operations, especially in subsidiary production, and for the weak orientation of scientific-technical progress toward the freeing of workers. According to the data in the table, in 1977 one single measure with respect to new equipment freed an average of 0.81 workers with an expenditure of 12,200 rubles (in 1970 -- correspondingly 0.94 workers and 11,900 rubles). The theoretical freeing of one employed person would, hereby, cost 15,100 rubles with an average annual wage of 2,064 rubles -- 2,836 rubles including payments and privileges from social consumption funds. Meanwhile, in industry in 1975 the proportion of workers involved in manual labor amounted to 54.6 percent (including manual operations with machines and mechanisms -- 7.3 percent and in renovation work -- 12.6 percent) and in subsidiary operations -- 72.4 percent. In 1975-1977 expenditures for new equipment in industry amounted to 20.8 billion rubles, and the proportion of workers involved in manual labor was reduced by a total of 1.1 percent: from 55.7 to 54.6 percent.

Effectiveness of Measures to Introduce New Equipment in Industry

	1970	1975	1977	1977 in percentage to 1970
Number of measures for introducing new equipment, in thousands	423	621	670	158
Actual expenditures for introduction of new equipment, millions of rubles	5011	7518	8168	163
Number of theoretically freed workers, in thousands	399	576	543	136
Annual economic effect from introduction of new equipment, millions of rubles	2607	3832	4193	161

(Table continued)

	1970	1975	1977	1977 in percentage to 1970
Actual expenditures in thousands of rubles for each measure	11.9	12.1	12.2	103
Number of theoretically freed workers for each measure	0.94	0.93	0.81	86
Annual economic effect of each measure, in thousands of rubles	6.16	6.17	6.53	106

The situation becomes more complex with respect to the cost evaluation of natural resources. The rapidly growing expenditures of social labor for their reproduction and preservation are only reflected to a negligible degree in the prime costs and prices of products produced by enterprises and associations requiring their resources. In spite of the nearly two-fold increase in the compensation rates of expenditures for geological prospecting operations since 1 January 1975, only about 40 percent of the expenditures of the state for these purposes is reimbursed. Payment by the stump -- the price of standing timber -- compensates for approximately half of the expenditures in forestry. Enterprises usually obtain fresh water from reservoirs without cost even though the state spends billions of rubles annually on water management. Land removed from agricultural use for the needs of industry, construction, and transport is not given the proper profit and loss evaluation. Enterprises, as a rule, do not compensate society for damage caused by environmental pollution. Secondary resources -- rocks and slag from mining enterprises, ashes and cinder from TETs and metallurgical plants, heat from waste gases and water, and so on -- have not undergone an economic evaluation and are not fully included in the economic turnover, as a consequence of which the load on primary natural resources continues to increase and their depletion, especially in the populated regions in the country, is accelerating.

Measures aimed at improving the utilization of natural resources and the protection of the environment are not economically advantageous to enterprises. Profit and loss interests and also the criteria of the effectiveness of new equipment and manufacturing methods being used in draft calculations come into conflict with the interests of society and the criteria of economic effectiveness.

The understated profit and loss evaluation of natural resources and damage to the environment represent one of the chief obstacles on the path to working out and introducing equipment and manufacturing processes that will protect nature and the environment. Enterprises are not doing enough with respect to measures for increasing the yield from oil-bearing strata (a significant portion of the prospected reserves from oil remains in the depths of the earth), the overall processing of minerals and forest raw material, and the utilization of waste. The burning of billions of cubic meters of valuable chemical raw materials -- incidental petroleum gas -- continues. Funds being allocated for the construction of purification installations are not producing the proper effect. Such an important index as the degree of the pollution of the atmosphere with harmful waste products

is practically not taken into consideration in calculations regarding efficiency and in the formation of the prices of new engines.

Because of the insufficient evaluation of expenditures for the reproduction of natural resources and the protection of the environment (the more so -- in the absence of such an evaluation), the prime costs and the prices of raw material, materials, and fuel which are intensive with respect to natural resources are underestimated, the sbustitution of natural materials with artificial and synthetic is held back, insufficient consideration is given to the economic effect, and incentives for reducing the material-intensiveness of products, introducing waste-free and reduced waste emitting manufacturing processes, and utilizing secondary resources are undermined.

The understated evaluation of primary resources -- labor and natural -- represents a barrier on the path to intensifying production. Such a situation becomes particularly intolerable in connection with the exacerbation of the deficit with respect to these resources in the future, which drew the attention of Comrade L. I. Brezhnev at the November (1978) Plenum of the CPSU Central Committee: "...one cannot but take into consideration the fact that from the beginning of the 1980's it will become necessary to place even more emphasis on the intensive factors of economic growth since other factors will be drastically reduced. This, above all, applies to opportunities for attracting new labor resources. This also applies to natural resources: their reserves in our country are vast, but their mastering requires growing capital investments".

What Can and Must Be Done

In order to obtain precise and synonymous criteria for the intensification of production, it is necessary to have a complete evaluation of socially necessary expenditures of labor for the reproduction of resources and a statement of these expenditures -- to the extent of the consumption of re-- sources -- in the prime costs and prices for products produced with their help.

As far as labor resources are concerned, enterprises should completely reimburse society for the expenditures involved in their reproduction -- not only in the form of wages, but also in that portion whose source is made up of the social consumption fund. A first step in this direction could be to double the deduction rate for social insurance in order to cover the expenses of the state budget for these purposes; in the future we should look at the introduction of special payments, the objective of which would be a sum of payments and privileges from the social consumption funds, which would be applied to each worker. The rates of such payments can be differientated according to sectors and categories of workers (payments and privileges from the social consumption funds would be appreciably greater for a miner, for example, than for a worker in the garment industry) and according to regions (expenditures for the reproduction of the labor force by means of the social consumption fund in the extreme north would be essen-

tially higher than in the southern areas of the country). Along with the sectorial and territorial differentiation of wages this would facilitate the purposeful mechanization of labor-intensive processes above all under unfavorable working conditions, would promote the expansion of the production of equipment in the northern area, and would hold back the location of labor-intensive production in areas with high expenditures for the reproduction of the labor force.

It is necessary to fully reflect socially necessary expenditures for the reproduction of natural resources (including their quality) in the prime costs and prices. The basic natural resources are already no longer a free gift of nature: the forestry and fishery industries annually expend many billions of rubles for prospecting for deposits of valuable minerals, irrigation, and land reclamation. The cost incurred by the labor of workers involved in the natural resource sector during the process of consuming natural resources is passed on to the product manufactured from these natural resources. Therefore, it is theoretically correct to have such a variety in the planned price as compensation rates for expenditures for the reproduction of natural resources and also the inclusion of these expenditures in the prime costs and prices of products of the extraction sectors. The general principles of planned price formation are extended to this aspect of pricing (naturally, taking into consideration the specifics of a particular sphere of production):

compensation rates are built on the basis of socially necessary costs (without excessive expenditures;

the standard profit is included in them;

the rates are differentiated in a dependence on quality and the effectiveness of the consumption of natural resources and also according to large regions.

Similar prices are already functioning in a number of extraction sectors. Thus compensation rates for expenditures for geological prospecting operations were introduced on 1 July 1967 and have been made more precise since 1 January 1975. The average rates are calculated from average annual expenditures for the finding and prospecting of valuable minerals in relation to the average annual magnitude of used reserves for the same period, which are equal to the sum of planned extraction and standard losses (only with respect to oil and gas, where there is no current accounting of losses, are rates established by the ton or 1,000 cubic meters of extracted product). The rates are differentiated according to deposits in a dependence on the mining and geological conditions involved in the processing of a deposit, the quality of the mineral deposited in it, and also taking territorial price differences into consideration.

Payment by the stump is to a great degree built on analogous principles. Its implementation in 1967 arose out of the necessity to compensate the expenditures of the forestry industry, and rates were differentiated according to

regions, types of timber, and the dimensions of the trunks.

Compensation rates for expenditures involved in land reclamation are now being introduced. Proposals for the introduction of payments for fresh water collected from springs are valid.

The regular revision of wholesale prices, which provides for an essential increase in prices for products of the extraction industry and of sectors of heavy industry directly connected with it, will create real prerequisites for their complete reflection in the prime costs and prices of expenditures for the reproduction of natural resources. Moreover, it would be rational:

to introduce compensation rates for expenditures incurred in geological and prospecting operations with respect to all types of valuable minerals and to increase the dimensions of the rates to a level which would completely compensate the expenditure to society for these purposes;

to increase the amounts of payments by the stump and to intensify their differentiation;

to introduce payments for water collected from springs for enterprises;

to establish compensation rates for expenditures incurred in land reclamation and payments for land taken out of agricultural service.

The introduction of similar measures will make it possible, on the one hand, to strengthen control over the effective utilization of funds allocated for the reproduction of natural resources; on the other hand -- to create more favorable conditions for economizing on natural resources, their overall processing, and the utilization of secondary resources.

The necessity has arisen to implement a general reevaluation of available natural resources as a result of the comparative effect of their consumption and the new level of wholesale prices; along with this, the bases for land, water, forest, and mining surveys will be created. Thus the application of current wholesale prices of mineral raw materials for an evaluation of mineral deposits, which do not reflect its actual costs, provides the basis for the transition to accounts relating to property of others in a significant portion of ascertained reserves. Moreover, the evaluation was not conducted simultaneously and according to various prices, and reserves which are sent to the slag-heap at some enterprises are frequently considered as fulfilling quality requirements in others. Prospective permissible price limits, which are calculated in such a way that the need of society for mineral raw materials would be satisfied by minimal combined expenditures of labor, should be made a part of the evaluation of newly opened mineral deposits.

One should also think about improving the evaluations of agricultural raw material in order to provide incentives for savings in this area. State

subsidies for the price of agricultural products could, perhaps, be expediently concentrated in the final stage of their sales, which would provide for a stability in state retail prices, and the expenditures of raw materials for its full value should be taken into consideration in the meat and milk industry. This requires a certain reorganization of the system of computation, but, on the other hand, savings as well as the overexpenditure of each ton of valuable agricultural raw material will become more important, the limits of the application of equipment and manufacturing methods will be expanded, which will promote a savings of raw material and a utilization of waste products.

The cost evaluation of fixed productive capital is frequently marked too high -- as a consequence of the fact that the prices of new equipment sometimes increase to a greater degree than the increase in its effectiveness as well as in connection with the existence of a payment for funds, which from the point of view of the profit and loss payments of an enterprise is tantamount to raising the cost of machinery and equipment. In the first place, it is necessary to provide for a reduction of the costs of production and the prices of new equipment per unit of its useful effect. This goal is served, in particular, by an obligatory accounting of the price limits and the draft prime cost for working out draft and normative-technical documentation for new products. The most important thing here is not even in pricing, but in bringing about an emphasis on qualitatively new equipment, which will provide for an essential improvement in its effect, and on the production and overall introduction of new generations and systems of machinery in the planning of scientific-technical progress. In price formation it is important to consider the regularities of the scientific-technical cycle while giving maximum incentive to the developments of pioneering equipment which surpass the highest world-wide achievements and while applying perceptible and inevitable economic penalties for the output of obsolete equipment and products.

In the second place, it is necessary when calculating the effectiveness of new equipment and determining prices for it to provide for the fullest evaluation and consideration of not only the direct economic effect (savings on wages, raw materials, materials, and fuel), but also all forms of the indirect effect -- social (improvements in working conditions and savings on expenditures for the reproduction of the labor force), ecological (preservation of natural resources, a reduction of environmental pollution), foreign economics (expansion of exports of pioneering-competitive equipment, the replacement of expensive imports with less expensive and qualitative domestic production).

In the third place, it is time to raise the question concerning the waiver of payment for productive capital (with a simultaneous increase of amortization reductions for renovation of fixed capital). If during its introduction payment for funds somewhat promoted their better utilization, now its stimulative role has been practically reduced to zero, and the negative consequences are becoming ever more percepitble. Payment for funds in 1977 amounted to 23 percent of the overall sum of the profit of industry (a total

of 3.3 percent of the average annual costs of fixed productive capital and standardized working capital). In certain sectors-the payment for funds is absent or is of a nominal nature. It has practically been transformed into a "flexible" form for redistributing profits and equalizing the profit and loss conditions of production in addition to a free balance, which absorbs 30 percent of the profit. In addition to the fact that the payment for funds results in an excess increase of prices for capital-intensive products and narrows the profit and loss limits of the application of machinery, the overstated cost evaluation of some resources in comparison with others distorts the results of the intensification of production.

It is worth noting that countries which were the first to institute payments for funds either gave it up (Yugoslavia) or drastically curtailed its dimension (Hungary). Payment for funds was rescinded in Bulgaria and its introduction was rejected in Roumania.

The elimination or partial limitation of payments for funds shifts a number of profit and loss accounting functions over to amortization deductions. The new rates of amortization for renovation are still low in spite of a certain increase in them at the end of the Ninth Five-Year Plan: They were based on an average service life of 21 years for fixed capital throughout industry, which is significantly less than in developed capitalist countries. The deduction rates for renovation should be raised considerably (especially for the active portion of fixed capital) above all at the expense of a further curtailment of deductions for capital repair, which consumes an unjustifiable amount of means and does not produce the necessary effect. In 1977 deductions for capital repairs throughout the economy on the whole amounted to 24.3 billion rubles -- 2.4 times as much as capital investments for the development of machine building. The new approach would make it possible to renew the supply of machinery and equipment at functioning enterprises at a significantly greater scale than at present in the course of their recapitalization and technical reequipping, which in itself is a decisive factor in the intensification of production.

Prices and Incentives of Intensification

The effect of prices on the intensification of production and the economical utilization of resources are not limited by a reflection of socially necessary expenditures of labor for their reproduction. How can we utilize the stimulative function of prices more actively especially in deviations of the effectiveness of the utilization of resources both for the better and for the worse? Since 1975 increased (penalty) payments for above-standard losses of minerals during their extraction have been introduced in a number of mining sectors. In accordance with the method worked out by NIITs [Scientific Research Institute of the Cement Industry] and confirmed by USSR Goskomtsen [State Committee on Prices] in 1977 it is planned to expand the limits of these payments and establish them on the basis of the economic damage caused by the losses. It is also intended to introduce privileges (complete or partial exception from payments for geological and prospecting work) in the extraction of oil above the established coefficient of oil

output, the extraction of minerals from mining dumps, the reduction of losses against the standards, and so on. Under the new conditions a mining enterprise which makes poor utilization of the wealth in the depth of the earth will incur losses in the calculated profits; if it achieves better indexes, it will receive an additional profit.

The new system will prove to be effective, however, under the condition that the indexes of the rational utilization of the earth's wealth will be taken into consideration in the bonus systems and in the formation of economic incentive funds at mining enterprises. So far it has not been put into effect. The experiment to give bonuses for more complete extraction and overall processing of mineral raw materials, which was introduced in several enterprises of ferrous and nonferrous metallurgy, did not become widely practiced.

Measures for strengthening the stimulative effect of prices on the savings of material and labor resources are being put into effect. The Ministry of Power Machine Building has been operating under the new conditions of planning and economic stimulation since 1 January 1979. In order to increase the economic interests of enterprises and associations in the reduction of material-intensive products and labor expenditures, it was established that in the utilization of economical materials and substitutes and more productive methods of manufacturing in production (without reducing the quality of the manufactured product) and also in the output of new and less expensive products, which are equal to or surpass the replaced products in their technical-economic parameters and quality, the wholesale prices should be determined in such a way that the previously formulated profit dimension will be preserved and the dynamics of the volume of production and the productivity of labor will be computed on the basis of prices adopted in the plan for previous output. These decisions pursue the goal of excluding a situation in which the successes of enterprises in the matter of economizing on materials and reducing the labor-intensiveness of manufactured articles would serve as a basis for reducing wholesale prices with a subsequent worsening of work indexes and conditions for the economic stimulation of progressive collectives. The new conditions will now be expanded to enterprises of other machine building industries.

The incentive to economize on past labor will, evidently, also be promoted by a rejection of profitability standards for articles in percentages to the complete prime cost, which placed enterprises producing articles with a high proportion of expenditures for past labor under privileged conditions -- it turns out that they have a greater amount of profit per ruble of wages. The transition to profitability standards with respect to their own expenditures (manufacturing costs) or to double expenditures, reduced -- for past expanditures, increased -- for own, is expedient. Such double standards are becoming used more extensively in the practice of price formation. With the abolition of the payment for funds the necessity for a standard in the first part disappears completely, which creates favorable conditions for the transition to an index of net standard output.

The data here represent only individual directions for possible improvement of price formation. The system of prices and of the evaluation of the resources of production can and should play a most active role in accomplishing the tasks of intensification in a unity and interdependence with the plan and methods of economic stimulation.

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NEW INSTRUCTIONS ON PLANNING NET OUTPUT INDICATORS

Figuring Net Output Standard Amounts

Moscow EKONOMICHESKAYA GAZETA in Russian No 40, Oct 79 p 6

[Methods instructions: "Normative Net Output"]

[Text] Methods Instructions on Procedure of Elaboration and Utilization of Net Output (Normative) Indicator in Planning; Ratified by USSR Gosplan, USSR State Committee for Prices, USSR Ministry of Finance, and USSR State Committee for Labor and Social Problems on 12 September 1979 and Coordinated With the USSR Central Statistical Administration

I. General Provisions

These Methods Instructions are to be used as a guide in working up a net output (normative) indicator in the five-year and annual plans of ministries (agencies), associations and enterprises pursuant to CPSU Central Committee and USSR Council of Ministers Decree No 695 of 12 July 1979.

Employment of standardized or normative net output in planning aims at improving production efficiency and work quality and at fuller utilization of the capabilities and advantages of socialist production. The normative net output indicator as a reflection of newly created value expresses the results of the specific efforts of work forces, eliminates incentive to increase the materials intensiveness of production, and promotes an objective appraisal of the performance of associations and enterprises.

These methods instructions define a uniform procedure of formation and ratification of net output standard amounts and application of the normative net output indicator in the system of indices of planning and evaluation of the activities of ministries (agencies), associations, and enterprises.

1. All-union and union-republic ministries (agencies) USSR shall change over to employment of a normative net output indicator in planning industrial production effective the beginning of the plan-covered year, in coordination with USSR Gosplan and the USSR State Committee for Prices. All associations and enterprises under a ministry (agency) shall convert over at the same time to employment of this indicator.

In certain instances, for the purpose of accumulating experience in applying normative net output, transition to employment of this indicator by individual all-union industrial associations, branch and territorial administrations shall be permitted with the agreement of and in coordination with USSR Gosplan.

Transition by republic ministries (agencies) shall be effected in a like manner, in coordination with the Gosplans and state price committees of the union republics.

Changeover by production associations (enterprises) to employment of a normative net output indicator shall be effected pursuant to an order issued by the appropriate minister (agency head), with the USSR Gosbank and USSR Central Statistical Administration being informed of this fact immediately.

2. Changeover by ministries (agencies), associations and enterprises to utilization of a normative net output indicator shall be preceded by organizational, methodological, and economic preparation for this work, which as a rule shall be completed three months prior to the designated changeover and shall include performance of the following measures:

elaboration, when necessary, of branch method instructions and their coordination with USSR Gosplan and the USSR State Committee for Prices;

elaboration of draft net output standard amounts for the entire product list and their ratification following the procedure specified by these Method Instructions;

performance of calculation, on the basis of ratified net output standard amounts, of the corresponding indices for the base year, for the coming year and subsequent years of the five-year plan, as well as anticipated plan fulfillment for the current year (based on normative net output volume, labor productivity determined on the basis of normative net output, etc);

performance of instructional and explanatory work among the labor forces of enterprises, associations, and ministries (agencies).

3. In accordance with the economic content of the normative net output indicator, it shall be utilized for determining the dynamics (growth rate) of physical production volume, labor productivity, for planning payroll fund and monitoring its utilization. The normative net output indicator shall also be employed in calculations of capital-output ratio and other indices. Profit contributions to a unified science and technology development fund established in the ministries and agencies, as a percentage of volume of normative net output, shall be made on the basis of the standard amount specified in the five-year plan (with year-by-year distribution).

4. For ministries (agencies), associations and enterprises which have changed over to employment of the normative net output indicator, appraisal of performance and determination of the results of socialist competition in

the part involving fulfillment of target for production volume, labor productivity and capital-output ratio, shall be performed on the basis of the normative net output indicator. The labor productivity growth indicator, calculated from normative net output, is utilized to determine the profit-funded bonus fund.

Release of funds for wage disbursement by USSR Gosbank institutions is performed as the normative net output target is met.

5. In the plans of ministries (agencies), associations and enterprises which have changed over to utilization of a normative net output indicator, the commodity output in comparable prices indicator is determined by calculation. This indicator is not used to appraise the performance of the indicated ministries (agencies), associations and enterprises.

6. For appraisal of meeting pledges pertaining to deliveries of product of production-technical designation and consumer goods by nomenclature (product assortment) according to contracts and schedule-orders for the manufacture of products for export for associations and enterprises which have changed over to utilization of a normative net output indicator, product sales volume shall also be ratified in the annual plans.

II. Elaboration and Ratification of Net Output Standard Amounts

7. The net output standard amount comprises a portion of the wholesale price of an item, which includes wages, social insurance deductions, and profit. The procedure of elaboration, deadlines for elaboration and ratification of net output standard amounts are analogous to the procedure of elaboration and ratification of wholesale prices.

Net output standard amounts shall be ratified by the USSR State Committee for Prices, by the union republic state committees for prices, councils of ministers of autonomous republics, and oblast (kray) executive committees of Soviets, by ministries, agencies, production associations (enterprises) and other organizations for those types of product for which they are authorized to approve prices.

Price-establishing agencies shall at the same time approve net output standard amounts.

8. Net output standard amounts shall be elaborated and ratified for the entire list of finished products, intermediate products, replacement parts, as well as all jobs and services of an industrial nature sold to other organizations, by which prices are ratified.

9. In those branches which employ zone prices, net output standard amounts are established applicable to the zone prices in effect for the product manufacturers.

10. Normative net output volume is established according to comparable standard amounts in a manner analogous to the procedure established applicable to comparable wholesale prices.

In revising wholesale prices on individual items for reasons not connected with change in labor outlays for their manufacture (change in material and component items utilized in their manufacture or the prices on these materials and components), corresponding net output standard amounts are as a rule not revised.

Net output standard amounts for product items for which temporary wholesale prices have been established, prices to be in effect a limited period of time, and prices on product items involved in one-time orders and experimental models (experimental batch consignments) shall be established for the period in which these prices will be in effect. Net output standard amounts shall also be revised when these prices are revised.

11. Net output standard amounts are as a rule branch standards. Net output standard amounts reflect average branch live labor outlays, which are determined in a procedure specified in wholesale pricing, on the basis of advanced labor-intensiveness standards.

Net output standard amounts shall extend to products manufactured by the production associations (enterprises) of those ministries (agencies) to the products of which the wholesale prices of the corresponding price list extend.

12. The net output standard amount for a product item is determined on the basis of its projected (plan-specified) production cost adopted by pricing bodies as a base for establishing a wholesale price. The materials submitted for elaboration of wholesale prices shall include figures requisite for calaculating net output standard amounts.

13. Wage amount, with social insurance contributions, to be included in the net output standard amount, shall be determined by adding the following:

a) wages of production workers with social insurance contributions (determined by adding together outlays on the corresponding product production costing items: "Basic wages of production workers"; "Supplementary wages of production workers"; "Deductions for social insurance from wages of production workers");

b) wages with social insurance contributions of other industrial-production personnel involved in production services and management (determined by computation with coefficient Kz).

14. Coefficient Kz is defined as the ratio of wages of industrial-production personnel of a production association (enterprise) employed in production servicing and management, to the wages of production workers:

$$Kz=\frac{ZPp-ZPpr}{ZPpr},$$

where ZPp -- basic and supplementary wages of industrial production personnel (from the figures on form 5, line 060 of the annual report); ZPpr -- basic and supplementary wages of production workers (from the figures on form 6, line 050 and line 060 of the annual report).

The difference between wages and all industrial-production personnel and wages of production workers comprises the wages of remaining industrial-production personnel employed in production servicing and management.

Illustration. Calculation of coefficient Kz for a production association (enterprise):

1. Basic and supplementary wages of industrial-production personnel -- 652,000 rubles

2. Basic and supplementary wages of production workers -- 250,000 rubles

3. Coefficient Kz, characterizing the ratio of wages of industrial-production personnel employed in production servicing and management to wages of production workers

$$\frac{(652-250)}{250} = 1.61.$$

Figures on wages of industrial-production personnel and wages of production workers, as well as calculation of coefficient Kz are utilized in production costing and for those same report periods for which materials are submitted for substantiating wholesale prices and net output standard amounts in a form in conformity with Annex 1, lines 21, 22 and 23.

15. Profit to be included in price and the net output standard amount is calculated from standard profitability amounts ratified for product price lists (groups) in relation to production cost minus direct material outlays (cost of utilized raw materials, fuel, electricity, supplies, semimanufactures and component items), in conformity with the methodology adopted by the agencies which establish prices for the given product category.

16. In conformity with the component parts established in points 13, 14, and 15 of these method instructions, the net output standard amount (NChP) for a specific product item shall be determined with the following formula:

$$NChP = Zpr + Zpr \times Kz + Pn,$$

where Zpr -- basic and supplementary wages of production workers with social insurance contributions in the projected (plan-specified) product production costing; Pn -- profit established on the basis of standard profitability (point 15).

Illustration. Calculation of product net output standard amount

1. Basic and supplementary wages of production workers in product item production costing -- 2,450 rubles

2. Deductions for social insurance from production worker wages in product item production costing -- 220 rubles

3. Coefficient Kz (point 14) -- 1.61

4. Product item production cost minus direct material outlays -- 11,424 rubles

5. Standard profitability (point 15) -- 35%

6. Standard profit $\left(\frac{\text{line 4 x line 5}}{100}\right)$ = 3,998 rubles

7. Net output standard amount (line 1 + line 2) + (line 1 + line 2) x x 1.61 + line 6 = (2,450 + 220) + (2,450 + 220) x 1.61 + 3,998 = 10,967 rubles

Calculation of a projected net output standard amount is a component part of product costing, submitted for substantiating a proposed wholesale price on a given product item (annex 1).

17. If a given product is manufactured at two or more enterprises, the net output standard amount is determined as a branch figure, in conformity with the current procedure of determining wholesale prices, that is, on the basis of branch average production cost, including branch average wages.

Illustration. Calculation of branch net output standard amount for a product manufactured by several enterprises (rubles)

Indicator	Enterprise		
	A	B	C
1. Number of units of a given product manufactured by enterprises	5	10	20
2. Basic and supplementary wages of production workers (with deductions for social insurance) in product production costing	33	15	11
3. Coefficient Kz, characterizing ratio of wages of industrial-production personnel employed in production management and services to wages of production workers for the production association (enterprise)	1.9	2.5	2.2
4. Basic and supplementary wages (with deductions for social insurance) of industrial-production personnel employed in production management and services (line 2 x line 3)	62.7	37.5	24.2
5. Wages of industrial-production personnel with deductions for social insurance in product production cost (line 2 + line 4)	95.7	52.5	35.2
6. Branch average wages of industrial-production personnel with deductions for social insurance in production cost* $\frac{52.5 \times 10 + 35.2 \times 20}{10 + 20} = 41$			
7. Production cost minus direct material outlays	148	125	100
8. Branch average production cost minus direct material outlays* $\frac{125 \times 10 + 100 \times 20}{30} = 108.3$			

Table (cont'd)

Indicator	Enterprise		
	A	B	C
9. Standard profitability on production cost minus direct material outlays, %	35	35	35
10. Standard profit $\frac{\text{(line 8 x line 9)}}{100}$ $\frac{108.3 \times 35}{100} = 37.9$			
11. Branch net output standard amount (line 6 + line 10) 41 + 37.9 = 78.9			

* Calculation of branch average wages and production cost is performed only from the figures of enterprises B and C, which manufacture the bulk of this product's output (86%).

18. When there are substantial deviations in individual production associations (enterprises) of conditions of cooperative manufacturing from average conditions, ministries (agencies) shall submit to price-establishing bodies proprosals on an appropriate differentiation of branch net output standard amounts taking into account differences in level of labor outlays proceeding from the different conditions of cooperative manufacture specified in the plan. (Continued in next issue)

Planning, Figuring Standard Net Output Volume

Moscow EKONOMICHESKAYA GAZETA in Russian No 41, Oct 79 pp 7-8

[Methods Instructions: "Normative Net Output"]

[Text] Methods Instructions on Procedure of Elaboration and Utilization of Net Output (Normative) Indicator in Planning

Price establishing bodies shall examine these proposals and when necessary approve differentiated net output standard amounts for individual production associations (enterprises).

With change in cooperative manufacturing conditions in individual production associations (enterprises) in comparison with those considered when establishing wholesale prices and net output standard amounts, ministries agencies) shall submit to the price establishing bodies proposals with calculations and substantiations on changing existing net output standard amounts. If a production association (enterprise) has begun receiving from an outside organization semimanufactures, parts, assemblies and components which when establishing net output standard amounts were included among those produced internally, the ratified standard amounts shall be reduced at the request of the ministries (agencies, by the net output standard amount ratified according to the established procedure for the indicated semimanufactures, parts, assemblies, and component items manufactured at associations (enterprises) specializing in their manufacture.

19. Differentiation of branch net output standard amounts may also be performed in other necessary cases, such as when the plan specifies production of nonspecialization items.

20. Production associations (enterprises) which have changed over to utilization of a normative net output indicator in 1973-1979, current standard amounts shall be employed until the adoption of new wholesale prices and net output standard amounts, pursuant to USSR Council of Ministers Decree No 697 of 12 July 1979.

Ministries (agencies) which have changed over to employment of a normative net output indicator shall elaborate and approve net output standard amounts until ratification of standard amounts by pricing agencies, guided by these Method Instructions and calculations on draft new wholesale prices going into effect in the 11th Five-Year Plan. The procedure of elaboration of these standard amounts may be refined with the consent of USSR Gosplan and the USSR State Committee for Prices.

Following adoption of new wholesale prices and corresponding net output standard amounts, the associations (enterprises) of all ministries (agencies) employing normative net output shall change over to utilization of the new standard amounts and shall refigure corresponding plan and base indices.

21. Net output standard amounts for new products coming into production shall be determined on the basis of their production cost adopted in determining wholesale price, that is, without figuring in the higher expenditures for starting up production, which are covered by the unified science and technology development fund, with the exception of products for which, in conformity with the current procedure, start-up costs are included in the product production cost and wholesale price. Basic and supplementary wages of production workers shall be determined for these products on the basis of the production startup estimate; these wages shall be added to the wages of production workers or the corresponding production costing items for this product. Net output standard amounts in these cases shall be determined taking into account overall labor expenditures on startup and production.

22. Net output standard amounts in markups, additional amounts added to list wholesale prices and discounts from list wholesale prices for design changes, export and tropical models, and in other additional payments and discounts connected with additional labor expenditures and figured in price lists and supplementary list wholesale prices, shall be calculated directly, proceeding from the net output elements contained in them (wages, etc). These standard amounts shall be determined and ratified by those agencies which establish corresponding markups, additional payments and discounts.

Additional charges and payments for change in the cost of materials and components are not figured in net output standard amounts, since they do not cause changes in labor outlays.

23. For products the manufacture of which is planned and figured only in value terms (jobs of an industrial nature, other products, etc), net output standard amounts are figured and ratified on the basis of costings (estimates) simultaneously with wholesale prices. With technical complexities in establishing concrete net output standard amounts, in connection with a large and changing list of jobs of an industrial nature and other products, specific net output standard amounts can be specified for this group of products in the form of stable standard coefficients characterizing for each enterprise the ratio of net output volume to the value of the corresponding products in enterprise wholesale prices for the 2 years preceding changeover to utilization of a standard net output indicator. For each product these standard coefficients shall not exceed 1.0. An example of calculation of a standard coefficient is contained in Annex 2.

These standard coefficients shall be elaborated and ratified by the ministry (agency) for each production association (enterprise).

24. For products manufacture of which is planned only in value terms but is figured both in value and physical terms (spare parts, intraplant cooperative manufacture supply, etc), one may utilize for determining planned volume of standard net output standard coefficients established in conformity with point 23 of these Method Instructions. Concrete standard amounts shall be employed to determine the actual standard net output volume for these products.

25. For products volume of which is included in commodity output by estimated costs not including profit (major overhaul and medium repairs on the enterprise's own equipment and means of transportation, etc), standard amounts or corresponding net output standard coefficients shall also be determined without including profit.

26. For enterprises which manufacture products with an extended production cycle, for which production volume in comparable prices includes change in uncompleted production balances, net output standard coefficients may be established for uncompleted production, which are determined as the ratio of standard net output volume for all product items with an extended production cycle to the corresponding commodity output volume. These coefficients are calculated and ratified by the higher organization for each production association (enterprise) on the basis of plan-specified calculations for each year separately. These coefficients are employed both when drawing up the plan and in the production report.

For production associations (enterprises) the products of which significantly differ in level of materials-intensiveness, particularly at individual stages of production, standard net output volume in uncompleted production shall be determined in the plan and report by direct count for each product for which change in uncompleted production balances is taken into account.

27. The specific features of elaboration of net output standard amounts in foundry and press forging operations producing finished product shall be

reflected in the branch method on procedure of the elaboration and utilization of standard amounts for products contained in Price List 25-01 -- "Wholesale Prices on Castings, Forgings, Die Forgings, Sets of Wooden Patterns, and Rough Machining."

28. The procedure of elaboration of internal production standard amounts is described in Annex 3.

29. Ministries (agencies) shall ensure:

a) the economic substantiation of draft net output standard amounts elaborated in the ministry (agency) system, and the reliability of the materials submitted for their substantiation, in order to eliminate the possibility of distortion of standard amounts;

b) correctness of utilization of net output standard amounts for products and services of subordinate production associations (enterprises) and the standard amounts ratified by them.

For this purpose ministries (agencies) shall regularly check the practice of establishment and utilization of net output standard amounts by production associations (enterprises) and shall take prompt measures to correct overstatement of net output standard amounts and other violations of established procedure.

Directors, deputy directors for economic matters (chief economists), planning division chiefs, and chief (senior) accountants of production associations (enterprises) shall ensure the genuineness of materials submitted for substantiation of net output standard amounts and the correctness of approval of standard amounts established by production associations (enterprises) to the extent of their authority, as well as correctness of their utilization.

Net output standard amounts ratified with violation of proper procedures shall be rejected, while indices, including funding indices, calculated on the basis of faulty standard amounts shall be recalculated according to the established procedure.

30. Extra agency verification of the correctness of establishment and utilization of net output standard amounts shall be performed in the same procedure and by the same agencies as monitoring and verification of establishment and application of prices.

III. Planning and Recording Standard Net Output Volume Indices Calculated on the Basis of Standard Net Output

31. Calculation of volume of standard net output shall be performed on all the components of industrial production: finished products and semimanufactures to be sold elsewhere; jobs of an industrial nature performed for an outside organization, as well as funded by the unified science and technology development fund; major overhaul and modernization of equipment performed by enterprise personnel, as well as change in uncompleted production balances and special process equipment fabricated in-plant, at the

end and beginning of the plan-covered period (increase or decrease) at those enterprises where they are figured in production, and other elements included, in conformity with the present procedure, in output in conformity with the Standard Instructions on preparing reports by industrial enterprises on fulfillment of the production plan (points 25 and 27), ratified 11 May 1971 by the USSR Central Statistical Administration.

Deviations specified for individual branches of industry, in conformity with which commodity output volume includes, as an exception, above and beyond the value of the finished products, also the value of semimanufactures produced in-plant, expended on the manufacture of said products, shall not extend to the standard net output indicator.

The completeness of product included in standard net output volume shall be determined in conformity with the specified Standard Instructions.

32. For products manufactured from the customer's materials (both paid for and not paid for by the manufacturing enterprises), standard net output volume shall be determined following the general procedure, that is, by multiplying the number of items produced in physical terms by current standard amounts.

33. Standard net output volume in the plans and reports of production associations (enterprises) shall be determined by direct count:

for finished items and other product scheduled in physical terms -- by multiplying production volume in physical terms for each product item by the specified net output standard amount;

for product scheduled and recorded only in value terms -- by multiplying production volume in wholesale prices (estimated value) by the standard net output coefficient ratified for each group and product;

for uncompleted production of a product with an extended production cycle -- by multiplying change in uncompleted production balances by the standard coefficients specified in point 26 of these Methods Instructions, or by direct count for each product with subsequent adding of results. Illustrations of such calculations are contained in annexes 4 and 5.

Overall standard net output volume for an industrial association and ministry (agency) shall be determined on the basis of the figures of the production associations and enterprises.

34. Standard net output volume is established in five-year plans for each year. In order to obtain more precise determination of standard net output volume, calculations shall be performed on as broad a list of product items as possible, in order to encompass by direct count not less than 80-85% of the total output volume of the ministry (agency). For product not covered by direct count, growth rate is planned proceeding from the growth rate of product determined by direct count, taking into account these products' growth established in past years.

Five-year plan targets for standard net output shall be ratified in the form of growth rate by year, determined by a running total.

Inasmuch as a number of branches employ, alongside standard or normative net output, a commodity output in comparable prices indicator, and also considering the necessity of preserving industrial output dynamics series for an extended period of time, total industrial output volume, output volume for groups A and B as well as the branch structure of industrial production in plans and reports at all levels of economic management shall be determined by commodity output in comparable prices. The commodity output indicator shall be determined by calculation for branches for which standard net output growth is ratified.

35. Standard net output volume in annual plans shall be elaborated with distribution by quarters, proceeding from the five-year target for the corresponding year of the five-year plan. In production associations (enterprises) calculations of standard net output shall be performed for the full list of products scheduled for manufacture.

If standard net output targets in annual plans are not below the targets of the five-year plan, they shall be established by the USSR ministries and agencies and union republic councils of ministers proper.

In cases where the indices of the draft annual plan for a USSR or union republic ministry and agency as a whole prove to be less than those established for the corresponding year of the five-year plan, they must be approved by the USSR Council of Ministers at the request of the corresponding union republic ministry (agency) or council of ministers and USSR Gosplan.

As calculation materials, all USSR ministries and agencies and union republic councils of ministers employing a standard net output indicator shall submit together with the annual draft plan designated standard net output volumes and growth rates.

36. In examining production association (enterprise) draft plans, industrial associations and ministries (agencies) shall verify the correctness of employment of net output standard amounts, and particularly their conformity with standards specified in wholesale price lists. Correctness of employment of differentiated net output standard amounts reflecting differences in production conditions shall be specifically checked.

USSR ministries and agencies and union republic councils of ministers, in case of changes made in draft production plans and physical terms shall recalculate the draft plans of associations and enterprises for standard net output.

37. In drafting plans for standard net output volume as a whole for a branch, ministry (agency), industrial association, as well as when checking draft plans submitted by production associations (enterprises), consolidated (group) net output standard amounts can be utilized, figured for groups of products of a single type (for example, for groups of metal-cutting machine tools, press forging equipment, electric motors, generators, etc),

analogously to calculation of group average wholesale prices. Consolidated (group) standard amounts shall be refined in case of a sharp change in the structure of products contained within the group.

Consolidated (group) net output standard amounts shall be utilized chiefly in drafting five-year plans.

38. Ministries (agencies) and industrial associations shall verify the validity of the draft plans of production associations (enterprises) for standard net output volume and growth rate and shall not permit understated targets for these indices. Targeted labor productivity growth and change in work force size should be taken into consideration.

39. Base period standard net output volume shall be determined by direct count for the entire product list (assortment), including items retired from production but manufactured in this period.

For items retired from production, if no net output standard amounts were established for them, these standard amounts shall be figured by the production associations (enterprises) and ratified by the higher organization. In cases where a large number of product items have been retired from production, these standard amounts may be elaborated and applied not to individual product items but to homogeneous product groups.

40. USSR ministries and agencies, with the agreement of USSR Gosplan and the USSR Central Statistical Administration, may plan and figure individual product items estimated only in value terms, in two measures: by comparable prices and net output standard amounts.

Estimate of fulfillment of the production target for these products is performed by standard net output, while production indices in comparable prices are utilized for consolidated and balance-sheet calculations.

41. Planning of labor productivity by standard net output per list-average worker of industrial-production personnel is performed in conformity with the established method, on the following labor productivity growth factors: improvement in the technical level of production; improvement of management, organization of production and labor; change in production volume; branch and other factors.

42. Under conditions of employment of the standard amount method of planning payroll, standard outlays for wages in kopecks per ruble of standard net output are determined by the established procedure. The plan specified payroll for industrial-production personnel shall be determined by multiplying the plan-specified standard net output volume by the quota of wages for payroll specified for the production association (enterprise).

In all other cases the plan-specified payroll shall be determined by the method currently in force, proceeding from the total number of industrial-production personnel, determined proceeding from the established work force limit and plan-specified average employee wages.

Considering the priority growth of labor productivity in comparison with growth in average wages, the payroll fund per ruble of standard net output should decline in comparison with the corresponding figures for preceding periods.

43. Volume of standard net output and labor productivity indices computed on the basis of this volume shall be presented in statistical reports in the following forms:

form 1-p (scheduled) "Production Association (Combine), Industrial Enterprise Report on Production and Total Number of Industrial-Production Personnel and Workers," and form 1-p, "Production Association (Combine), Industrial Enterprise Report on Fulfillment of Production Plan," with targeted and actual figures on the standard net output indicator entered in line 03;

on form 8 of the annual report, targeted and actual figures on the standard net output indicator shall be entered on line 03 of section I and on line 32, "Reports";

on forms 2-t (brief), "Brief Report of a Production Association (Combine), Industrial Enterprise on Fulfillment of Labor Plan" and 2-t (quarterly), "Production Association (Combine), Industrial Enterprise Report on Labor Plan Fulfillment";

figures on standard net output corresponding to report indices on form 1-p (scheduled) and on form 1-p shall be entered on line 47, "Output Volume by Indicator Adopted for Planning Labor Productivity";

planned and actual figures on net output per employee shall be entered in all columns on line 50, "Output Per Industrial-Production Worker by Indicator Adopted for Planning Labor Productivity";

on form 9 of the annual report, figures on standard net output volume shall be entered on line 47, section I; targeted and actual figures on average annual standard net output per employee shall be entered on line 50, section I.

Line numbers apply to report forms for 1979 and 1980.

This procedure of filling out report forms shall be introduced at the moment of changeover to employment of the standard net output indicator in planning and evaluation of production association (enterprise) performance.

44. When a ministry (agency) changes over to planning by standard net output, after the five-year plan is ratified the standard net output volume shall be calculated for the remaining years of the current five-year plan on the basis of the five-year plan targets for output in physical terms and ratified net output standard amounts. Production and labor productivity growth five-year plan targets for the remaining years, when necessary, shall be reapproved according to the established procedure, in conformity with the standard net output growth rate.

For determination of the growth rate of standard net output for the remaining years of the current five-year plan on the basis of corresponding standard amounts, actual standard net output volumes shall be determined for the year preceding transition to this indicator, including month by month for that year.

Results of five-year plan fulfillment shall be determined by a running total from the beginning of the five-year plan, including with transition to standard net output not from the beginning of the five-year plan -- by multiplying the growth rate of commodity output in comparable prices by the growth rate of standard net output for the periods of employment of these indices.

45. When a ministry (agency) changes over to planning by standard net output, following approval of the plan for the current year, standard net output volume shall be calculated for the entire year on the basis of the ratified output target in physical terms and ratified net output standard amounts. When there is a discrepancy between commodity output growth in comparable prices and the calculated growth rate of standard net output, the targets of the annual plan for production and labor productivity growth shall be reapproved according to the established procedure.

46. Industries (agencies), associations and enterprises shall conduct on a regular basis analysis of the results of utilization of the standard net output indicator, and particularly as regards its influence on increasing production efficiency, forming of the product list plan and its fulfillment, increase in the manufacture of new, advanced products, reduction in the materials intensiveness of products, and utilization of the payroll fund.

On the basis of this analysis, measures are specified for further increasing production efficiency and improving practices and method of employing standard net output.

Annex 1

Form for Calculation of Standard Net Output as a Component of Product Costing

Ministry (Agency) _____

(Manufacturer, City, Telephone)

Costing

of _____

(indicate product designation, grade)

Effective wholesale price _____ rubles _____ kopecks

Date of ratification of wholesale price _____ 19 _____

Price approved by _____

Date of initiation of series (mass) production _____

Costing unit

_____

(indicate unit of measurement)

Section I. Product Unit Cost

No.	Designation of Expenditure Items (According to List Specified by Branch Instructions) and Indices	Product Production Cost		Projected Production Cost For Calculating Price and Standard Net Output
		According to Report for 19___ (Preceding Year)	According to Ratified Technical, Output and Financial Plan for 19___ (Current Year)	
1	2	3	4	5

Calculation is performed on the following expenditure items (Column 2, Section I):

1. Raw materials and supplies

2. Usable waste and scrap (subtracted)

3. Purchased component items, semimanufactures and services of subcontractor enterprises

4. Fuel and electric power for manufacturing process needs

Total Direct Material Outlays

5. Basic wages of production workers

6. Supplementary wages of production workers

7. Deductions for social insurance

8. Expenditures for preparations and production startup

9. Expenditures for equipment servicing and maintenance

10. Shop expenditures

11. General plant expenditures

12. Other production expenditures

13. Production cost

14. Expenditures additional to production

15. Full production cost, including:

16. Production cost minus direct material outlays (line 15 -- total of lines 1, 2, 3, and 4)

17. Standard profitability and production cost minus direct material outlays, %

18. Profit $\frac{\text{(line 16 x line 17)}}{100}$

19. Projected wholesale price (line 15 + line 18)

20. Basic and supplementary wages of production workers, with deductions for social insurance in costing unit production costs (line 5 + line 6 + line 7)

21. Wages of industrial-production personnel of the production association (enterprise) (form 5, line 060 of the annual report for the year preceding calculation of standard amount)

22. Basic and supplementary wages of production workers of the production association (enterprise) (form 6, lines 050 and 060 of the annual report for the year preceding calculation of standard amount)

23. Coefficient Kz, expressing the ratio of wages of industrial-production personnel employed in production services and management to wages of production workers of the production association (enterprise)
$\frac{\text{line 21 - line 22}}{\text{line 22}}$

24. Wages of industrial-production personnel for production services and management, with deductions for social insurance in costing unit production cost (line 20 x Kz)

25. Net output standard amount (line 20 + line 24 + line 18)

Annex 2

Illustration of Calculation of Standard Coefficient of Net Output for Production Planned in Value Terms (based on the report for the 2 years preceding changeover to employment of a standard net output indicator)

(thousand rubles)

No.	Indices	Replacement Parts	Jobs of an Industrial Nature	Other Production
1.	Output volume in enterprise wholesale prices	2375	495	440
2.	Basic and supplementary wages of production workers, with deductions for social insurance	400	201	70
3.	Coefficient Kz, expressing ratio of wages of industrial-production personnel employed in production services and management to wages of production workers	1.61	1.61	1.61

Table (cont'd)

(thousand rubles)

No.	Indices	Replacement Parts	Jobs of an Industrial Nature	Other Production
4.	Wages of industrial-production personnel with deductions for social insurance in commodity output production cost, to be included in standard net output volume (line 2 x (1 + Kz)	1044	525	183
5.	Profit from sale of commodity output	475	45	52
6.	Standard net output volume (line 4 + line 5)	1519	570	235
7.	Standard net output coefficient:			
	a) calculated as (line 6:line 1)	0.64	1.15	0.53
	b) to be approved	0.64	1	0.53

Annex 3

Procedure of Elaboration of Intraproduction Net Output Standard Amounts

1. To ensure unity of plant and intraproduction planning, it is recommended that the standard net output indicator be employed in intraproduction planning and in profit and loss accounting.

2. In elaboration of intraproduction net output standard amounts, one should take into consideration the specific features of the system of intraplant planning and cost accountability at each enterprise.

3. At enterprises which employ calculated prices, they should be replaced by intraproduction net output standard amounts for all products produced by the shops (machine-sets, parts, assemblies, etc). In those cases where intraproduction planning prior to changeover to standard net output was performed on the basis of standard labor requirements or standard wages, changeover of intraplant planning to standard net output is not mandatory.

4. Intraproduction standard amounts shall be elaborated by distribution of the standard amount as a whole for the finished product by its component machine-sets (parts, assemblies).

5. Calculation of the intraproduction net output standard amount for the machine-set (part, assembly) shall be performed by distributing the net output standard amount for a product [illegible] proportional to the percentage share of basic wages of production wo[illegible] given unit of product in the overall quantity of basic wages of pro[illegible]tion workers for the given product item, according to the formula:

$$NChPk = \frac{NChPi}{Zi} \times Zk,$$

where NChPk -- net output standard amount per machine-set; NChPi -- overall plant net output standard amount for product item; Zi -- basic wages of production workers for product item; Zk -- basic wages of production workers for machine-set.

With this method of calculation, the sum of net output standard amounts for all sets (parts) is equal to the overall plant net output standard amount for the product item.

Annex 4

Calculation of Standard Net Output Volume in Change in Uncompleted Production Balances With the Aid of a Standard Coefficient

No.	Indices	Sum, thousand rubles
1.	Change in uncompleted production balances, by production cost	+3109
2.	Coefficient of conversion of production cost of uncompleted production increase into wholesale prices	1.2
3.	Net increase of uncompleted production balances in wholesale prices (line 1 x line 2)	+3730
4.	Standard coefficient of conversion of net increase in uncompleted production in wholesale prices into standard net output volume	0.296
5.	Standard net output volume in change in uncompleted production balances (line 3 x line 4)	+1104

Annex 5

Direct Calculation of Standard Net Output in Change in Uncompleted Production Balances for a Specific Product Item

No.	Indices	Sum, thousand rubles
1.	Production cost of uncompleted production balances:	
	at beginning of plan-covered (report) period	1500
	of that, basic wages of production workers	250
	at end of plan-covered (report) period	5600
	of that, basic wages of production workers	800
2.	Change in basic wages of production workers in production cost of uncompleted production	+550
3.	Net output standard amount	2000
4.	Plan-specified (in current plan) quantity of basic wages of production workers per unit of given product item	900
5.	Standard coefficient of net output for a given product item (line 3:line 4)	2.22
6.	Standard net output volume in change in uncompleted production balances (line 2 x line 5)	+1221

3024
CSO: 1820

FINANCIAL BALANCE AND PLANNING THE CIRCULATION OF MONEY

Moscow DEN'GI I KREDIT in Russian No 9, Sep 79 pp 21-28

[Article by Prof A. M. Lyando]

[Text] The theoretical foundations of the financial balance of the national economy and of the methodology for compiling it are in need of further development if the balance of the economy is to be improved as referred to at the 25th CPSU Congress. It is also important to discover those new possibilities which the financial balance affords for improving the planning of the circulation of money.

The financial balance of the national economy is an interconnected system of indicators making it possible to obtain a comprehensive reading of the financial results of expanded socialist reproduction and to discover the basic financial proportions, the composition of financial resources, investments and cost, and the financial-credit relationships of the sectors of the economy and individuals with the financial, credit and insurance systems, as well as mutual relationships among the latter.

It reflects the financial flows from the socialist economy and individuals to the finance-and-credit system, funds left to the direct disposition of economic entities, as well as the uses to which financial resources are committed.

This balance sheet offers an easy-to-read representation of the two-way and continuous process of the formation of state revenues (the budget) and the income of socialist enterprises and organizations and of their use (expenditure) to finance the costs of expanded reproduction, improvement of the well-being of the people and other national goals.

The financial balance of the national economy makes it possible to obtain a mental summary of the financial results of socialist reproduction, and it reflects in the integrated form of a summary balance sheet and consolidated indicators all the financial resources of society and their expenditure (use) over a specified period of time.

As a summary balance it affords the possibility of analyzing and planning the final results of production when money resources are being used simultaneously to meet the needs of production itself and also to cover society's other needs. The bulk of the resources included in the financial balance entered after the goods produced have received social recognition, i.e., after they have been sold to the consumer. It is in this sense that we can say that the financial balance also reflects the social utility of the social product produced.

The unity of the material-physical and value aspects of reproduction and the planned nature of the circulation of money require that the financial balance, along with the balance of the national economy, the budget and the credit plan, be drafted as an independent instrument whose use makes it possible to find better solutions to important national economic problems. The possibilities it creates are the following:

a) complete and comprehensive recording of accumulation, income and other financial resources of socialist enterprises and the state regardless of whether they flow into financial and credit institutions or remain at the direct disposition of economic organizations;

b) financial backing of the assignments of the national economic plan;

c) mutual reconciliation of the movement of resources and expenditures of the various segments of the financial-and-credit system and also of their interrelations with the finances of the sectors of the economy;

d) optimum balance of the movement of financial and credit flows so that along with comprehensive coverage of society's needs over the planning period provision is made for the interests of the circulation of money and the constant growth of the purchasing power of the ruble;

e) mutual correlation of the two basic money balance sheets--the financial balance and the balance of personal money income and expenditures in order to raise the level of planning of the circulation of money as a whole;

f) fuller study and analysis of financial relations of central and local subdivisions and the sectors of the economy;

g) better balance between physical and value proportions in reproduction.

Since there has been insufficient theoretical treatment of the problems of the methodology of compiling the financial balance of the national economy and of the possibilities of its more effective use in summary financial and credit planning, there is wide diversity in the description of the range of financial and credit relations which it is supposed to embrace and also in the assessment of its role and significance in financial and credit planning and even in the name of the balance itself.[1]

For instance, the following names of the balance are used in the literature: the unified financial plan of the national economy; the summary financial plan of the national economy; the summary financial plan of the state; the financial balance of the national economy; and the summary physical-financial balance of the national economy.

The role and significance of the financial balance of the national economy, the range of financial and credit relations to be included in the financial balance, and the basic elements of the methodology for compiling it derive from the economic nature of finance and credit and also from the content of the activity of the finance-and-credit system. But these terms are not always interpreted in the same way. Some economists confine the range of financial relations solely to the relations of distribution,[2] while others suppose that financial relations mediate the entire circulation of money in the socialist economy.[3]

A number of economists include credit in the term "finance," while others suppose credit to be an independent economic category.[4]

One of the most debatable methodological problems of compiling the financial balance of the national economy is the question of the limits of its scope. There are several points of view on this issue. Some economists feel that the financial balance must show the sum total of financial resources of society and their use regardless of whether they take the form of money or a physical form and the entire process of the formation of primary and final income.

Others hold that this balance should reflect only the set of money relations related to distribution and use of proceeds from the sale of products and the rendering of services to reimburse current costs, to expand production and to meet other needs of enterprises.

In settling the question of the scope of the financial balance and in developing methods of coordinating the physical and financial-value aspects of reproduction we must distinguish the individual stages of compiling the national economic plan and the financial balance of the national economy and take into account the possibilities and conditions for balancing the physical and value aspects of reproduction.[5]

The methodology of compiling the planned financial balance of the national economy should therefore rest on the methods of compiling the financial plans of the economic sectors and industries and the methods of compiling such summary plans as the state budget, the credit plans of banks, and the financial plan of Gosstrakh [USSR Main Administration for State Insurance]. Circular flows which are duplicated in this process must be eliminated. This balance, which does not encompass the entire monetary circulation of society, records the principal stages in the circulation of money, those crucial to the planned nature of the country's entire circulation of money.

Accumulation and other financial resources of state socialist enterprises and organizations have decisive importance among the income items of the financial balance. Funds collected from individuals represent only about 10 percent of the balance, even if we take into account the flow of deposits into savings banks, which is reflected in the credit plan of Gosbank. The principal sources of the financial resources of society and the state are the money accumulations of the socialist economy (in the form of profit and the turnover tax).

This is evident from the following table:[6]

In billions of rubles

	1966-1970	Share, %	1971-1975	Share, %	1976-1980	Share, %
Financial resources of the state--total	913.0	100.0	1,459.0	100.0	1,900	100.0
Breakdown:						
1. Money accumulation (profit and the turnover tax)	541.3	59.2	788.9	54.0	1,075	61.2
2. Depreciation	122.8	13.4	200.0	13.6	320	16.8
3. State taxes and levies on individuals	61.3	6.7	89.5	6.1	95	5.0

Note: In planning practice the financial resources of the state do not include the financial resources of kolkhoz and cooperative organizations nor the resources of voluntary public organizations.

The computations made in connection with the financial balance of the national economy show that the size of the financial balance in the 10th Five-Year Plan reaches about 2,000 billion rubles.

The principal purpose for which the resources reflected in the financial balance are used are the growth of fixed capital and working capital of economic entities and society's expenditures for social welfare and cultural programs, defense and government administration, and the formation of reserves.

As for how completely the financial balance reflects monetary relations, we hold that credit is an economic category which cannot be dissolved in another category, finance, which is close to it, but not identical. Credit relations must be reflected in the financial balance, not only on the basis of the overall results of resources and investments, but also by specific ministries and sectors.[7]

Credit is occupying an ever greater place in the system of economic relations, and the linkage between credit and financial flows must be ensured

through the financial balance of the national economy both with respect to resources and also investments, and not just through the budget.

In connection with the financial balance's reflecting credit relations there must be a solution to the question of methods of reflecting the indicators for short-term credit; on the basis of turnover in extending credit or on the basis of the change in the level of Gosbank's outstanding credit.

If the financial balance reflects credit on the basis of the turnover of the granting and repayment of short-term loans, financial and credit indicators become incomparable. For instance, the turnover of short-term loans granted by Gosbank in 1975 exceeded 2,000 billion rubles, while the resources of the financial plan of the state represented only about 300 billion rubles. That is why the only acceptable method of reflecting credit resources is to show the change of short-term investments and equivalent resources.

In describing the methodology for reflecting the indicators of the credit plan of Gosbank concerning extension of short-term credit in the unified (summary) financial plan of the national economy of the First Five-Year Plan Prof M. I. Bogolepov, who supervised compilation of the financial balance of the First Five-Year Plan, wrote: "Insofar as it pertains to the domain of short-term credit, the credit plan occupies a special place in the system of the financial plan and in the planning system in general.... In the system of the financial plan the credit plan gives up the hopeless attempt to determine the peak loads on the credit system and the volume of turnover. Using the method of annual or 5-year remainders, which reflect the movement of various bank accounts, it sets itself the task of finding the numerical expression of the normal need which the various sectors of the economy have for credit resources."[8]

The best way to reflect flows of money more correctly in the financial balance of the national economy is for the money turnover of enterprises to be divided into two parts: one resulting from the current production and economic activity and the other reflecting the results of that activity. The many years of experience in planning the finance of the national economy have shown that it is sufficient for financial plans of economic entities and the financial balance of the national economy to reflect mainly the second part of the circulation of money; however, this does not eliminate the necessity for bringing the most important elements of the financial and credit plans into conformity with the country's entire circulation of payments.

The financial balance of the national economy is used as a kind of scale to weigh (measure) the permissible strain on the financial and credit resources of the state for financing the process of the expansion of production and for social welfare and other programs without detriment to the interests of the circulation of money.

For many years the cash and credit plans of Gosbank and the balance of personal money income and expenditures compiled both for the entire nation and in a regional breakdown have mainly been used for many years to plan the circulation of money. At the new and higher level of economic development possibilities are opening up for a further improvement of the planning of the circulation of money. Fuller use of the financial balance of the national economy is expedient to that end; recently it has been attracting more and more attention from economists studying the problems of financial and credit planning.[9]

Credit resources and their use, as we have noted, must be taken into account in the financial balance of the national economy provided, and this condition is mandatory, that one does not count more than once resources which are one and the same and which are reflected in the financial plans of economic entities, a portion of them then goes into the state budget, and from their they are transferred to Gosbank, and so on.

Without denying the specific nature of the financial and credit methods of pooling and using money and of furnishing money resources to economic entities, we should see the features which they have in common and which make it possible to plan financial and credit flows together; these features are as follows:

a) the unity of the entire national economy as a complex and the planned nature of its development;

b) the unity of the state's economic and financial policy and the unity of the goals of financial appropriation and credit financing;

c) the fact that the budget and credit share the same principal sources;

d) the commodity-money basis of financial and credit flows.

Our point of departure must be the tasks of strengthening the unity of credit and finance and also the fact that finance and credit complement one another and the fact that improving the balance of the budget, credit and sector finance is a most important condition for the internal consistency of the circulation of money as a whole and of cash circulation in particular.

The mutual relations between finance and credit must undergo further development, especially at the level of enterprises and associations. In recent years we have noted a tendency in the system of sector finance toward establishment of a fixed share of the profit of economic entities deducted and paid into the state budget. The creation of associations and expansion of the initiative and maneuvering capabilities of economic entities has tended to complicate financial and distributive relations in the system of sector finance.

Redistributive financial flows within ministries and associations now occupy a substantial place in sector finance. Credit's relations with the sectors of the economy are expanding. All this makes it urgently necessary to reinforce the principles of unity in planning financial and credit indicators for the year and for the 5-year period.

It would seem advisable in this connection for financial plans of economic entities and sectors of the economy to reflect not only long-term, but also short-term credit, and it would also be wise to define the procedure for participation of Gosbank institutions in the combined planning of financial and credit flows.

At the present time Gosbank extends credit to economic entities to cover inventories within the allowance, which has made the line between own and borrowed working capital less clear. Beginning in 1968 the allowances in light industry and the food industry were raised mainly thanks to short-term bank credit.

Given that situation, the proper relationship can be established between the individual sources of working capital only if we have a complete idea of all the financial and credit resources and their use, i.e., only if we have a unified financial plan. This gives rise to the question of Gosbank's participation in making decisions on the credit financing of the sector's of the economy on the basis of an examination of the unified finance-and-credit plan of the ministry or association (enterprise).

At the present time the planning of credit with respect to short-term credit financing is limited to quarterly planning and the quarterly declaration of the economic entity, which is not enough. We share the views of economists who believe that in the sphere of credit planning we must move on to annual planning, beginning with the primary units of the economy.[10] This is one of the most important conditions for including credit relations in the system of the financial balance of the national economy. The second condition is that the financial balance correctly record the growth of working capital of economic entities and the sources from which working capital is built up.

At the present time the financial plans of economic entities reflect mainly net income and depreciation deductions, i.e., conventional net output of the enterprise and the expenditures and investments financed from those sources, as well as relations with the state budget and Stroybank. Changes in indebtedness of economic indicators are shown in Gosbank's credit plan for short-term credit financing.

Financial resources reflected in the financial plans of economic entities represent with respect to their economic content a portion of society's national income created in the year being planned as well as the depreciation fund.

The loan fund of the state represents a portion of society's national wealth, and only its growth is provided for mainly from the national income. For that reason the "compatibility" of indicators for finance and credit in financial plans is possible only if credit is reflected on the basis of the change of indebtedness.

The reasons why it is inadvisable for the turnover of the granting of short-term credit to be indicated in the financial plans of economic entities are as foll ws.

The circulation of the credit ruble has to be looked at in two planes--from the standpoint of society as a whole and from the standpoint of the individual enterprise. For the individual enterprise every loan which Gosbank grants and every one which is repaid constitute a credit operation in which credit relations come about. From the standpoint of society as a whole real credit relations come into being for the first time only as a result of a change in credit investments and the corresponding credit resources. We must recall the following in this connection. In describing the three stages of the movement of capital $D - T \begin{matrix} \nearrow R \\ \searrow S_p \end{matrix} - \ldots P \ldots T^1 - D^1$, K. Marx noted that the process of the creation of value occurs only in the second stage, in the process of production. Accordingly the transformation of capital from the productive form to the commodity form he looked upon as the real metamorphosis of capital as distinguished from the formal metamorphoses, which take place in the sphere of distribution in the first and third stages and in which there is a simple substitution of the forms of capital, but no growth of it.

An analogous methodology also needs to be used with respect to revealing credit's role at the macroeconomic level. From the standpoint of society as a whole the planned growth of credit investments of banks and corresponding resources represents the real (but not formal) source of satisfying society's new requirements.

From the standpoint of the national economy as a unified complex short-term credit investments are solidly merged with all the elements of the economic organism, with its structural subdivisions, and with the sectoral and regional distribution of the productive forces.

In this respect and from the standpoint of the long-term tendencies in the development of the physical and material base of socialist society budget and credit investments to develop the economy differ little from one another, and there is every justification for the financial plans of economic entities to coordinate and reflect budget investments on the basis of the sum total of annual expenditures and short-term credit investments on the basis of the growth of outstanding indebtedness.

In the financial planning of the working capital of economic entities the task is not to plan the sum total of its turnover. The plan determines only the change in working capital at the end of the planning period. The outstanding Gosbank credit of economic entities can be planned accordingly.

The principal proportions of the income and expenditure sides of the financial balance of the national economy also have decisive importance to the planning of cash circulation. Some researchers point to the importance of the state budget in this connection. We must take into account, however, that the budget may have favorable proportions in revenues and expenditures and even an excess of revenues over expenditures when the results are the opposite in Gosbank's credit and cash plans. The financial balance affords a more complete and correct picture in this regard, since the budget, credit and finance of the sectors of the economy are integrated into a single whole in the financial balance.

If income exceeds expenditures in the financial balance of the national economy, this means that the state and its agencies, and through them the State Bank, are receiving more cash than they are disbursing, i.e., there will be a partial withdrawal of currency from the channels of monetary circulation. This is reflected in the balance of personal money income in the form of personal expenditures to purchase goods and services and to meet other needs exceeding personal income.

If expenditures exceed income in the financial balance, then a two-way problem has to be solved in the planning process: either to attempt a certain reduction of costs or to find reserves and new sources of income. Usual practice is a combination of both, but if it proves necessary to have an excess of expenditures over income in the financial balance for the planning period, then this will mean that in the balance of personal money income there will be an excess of personal expenditures to purchase goods, to pay for services, and to make payments and contributions into the financial and credit system, and that brings about issue of currency into circulation.

The financial balance cannot be set against the balance of personal money income, but it is legitimate to raise the question of the priority of the financial balance in planning the circulation of money.

The present methodology for compiling the planned financial balance does not provide for a separate indication of all personal income and expenditures. They are as it were concealed by a financial membrane.

In the stage of the distribution of the national income the income of individuals and juridical persons is made separate and distinct with the help of financial relations. That share of the national income which is destined for individuals in the form of money income is to some degree determined by means of financial and credit relations.

There is a need for more comprehensive reconciliation of the two basic money balances--the financial balance and the balance of personal money income and expenditures--not only with respect to their overall balance-sheet results, which is done now, but also with respect to the most important components of those balances (remuneration, payments to individuals from the state budget, payments from economic incentive funds, etc.).

It would be advisable to use the system of coefficients of direct and full inputs computed for the intersector balance of the social product and to work out a system of indicators with which one could discover in the course of variant approximations to the optimum how the change of expenditures in the financial balance during the planning period will affect the change in personal income in the balance of personal income and expenditures, and conversely, how the change in the income of the financial balance will affect the expenditure side of the balance of personal money income and expenditures.[11]

Some economists underestimate the importance of the financial balance in solving a large national economic problem--attainment of unity of the entire financial and credit system and raising the level of planning of the circulation of money. For instance, G. K. Shekhovtsev writes that he does not share the point of view favoring reconciliation and linkage of the financial plans of the national economy by means of the summary financial plan of the state. In the opinion of that author this is only an economic balance-sheet computation which is used to balance the state's revenues and expenditures mainly in the first stage of summary planning, i.e., when neither the budget nor other financial plans have yet been drafted. Formation of a unified system of financial plans of the national economy is attained, in his opinion, only in the process of compiling the budget.[12]

Without denying the great importance of the state budget in financial planning, we should at the same time note the important role of the credit plan in ensuring unity in the finance-and-credit planning and in the planning of the entire circulation of money. This unity is best provided for within the financial balance of the national economy.

Proper coordination of financial and credit flows can be guaranteed through effective use of the budget and the credit plan, but also with the methodology Soviet economists have developed for compiling the financial balance of the national economy, whose basic elements were set forth back at the end of the twenties.[13]

Correctly recording Gosstrakh's money reserves and operations and reflecting them in the financial balance of the national economy are an important aspect of improving the planning of the circulation of money. These operations should be reflected not only with respect to profit, as is now the practice. Society must know what sort of insurance and reserve funds it possesses during the planning period and what financial forms they take.

In the 10th Five-Year Plan the total amount of insurance payments received by USSR Gosstrakh was 42.0 billion rubles, including 28.7 billion rubles on the basis of voluntary forms of insurance taken out by individuals. At the end of 1980 the intention is to write 150 million insurance policies with individuals.[14]

The possibilities for planning the circulation of money will be enhanced if the financial balance distinguishes the sum total of financial reserves and insurance funds.

The present practice of linking together and achieving the unity of the sector, the economic entity, the budget and credit is in need of extension and improvement. It is indispensable that the financial balance show in detail the growth of the resources of the financial balance with respect to all the forms and types--financial and budget institutions, credit institutions and insurance institutions--and the purposes for which they are used.

The planning work on the financial budget, on budget and credit plans, and on the balance of personal income and expenditures should be done side by side so that revision of the indicators in each of them will be reflected in all these plans. This will make it possible to raise the level of mutual consistency of all units in the finance-and-credit system and money circulation as a whole.

This does not preclude the possibilities of using the financial balance (the summary financial plan of the state) in the preliminary stage of drafting the state budget. But we cannot agree with the statement of G. K. Shekhovtsev, who believes that under present conditions financial and budget planning begins with drafting the summary financial plan of the state and ends with a budget that is based on an integrated system of interconnected and balanced financial plans of the national economy.[15] These statements underestimate the importance of credit planning. As noted by a number of economists, the unity of finance and credit must be strengthened, and at the same time the spheres in which the budget-financing and credit-financing methods are used should be delineated on a scientifically sound basis.[16] Moreover, even after the state budget and credit plan are drafted, work should not be halted on summary financial and budget planning.

To guarantee a higher level of regional planning of the circulation of money the transition should be made to regular drafting of financial balances for each union republic.

This is also necessary because balances of personal money income and expenditures are compiled not only for the nation as a whole, but also for each union republic, while financial balances are drafted only for the USSR as a whole.

Adoption of the principles of comprehensive plans aimed at specific goals in national economic planning has great progressive importance both at the

national level and in regional breakdowns. Along with a number of other measures taken to that end, there is also a need to improve the system of regional financial planning, which is not limited to local budgets and budgets of union republics. Calculations we made for Tatarskaya ASSR have shown that the total size of that republic's 1976-1977 budget was less than 20 percent of the total volume of its regional financial balance.

The new USSR Constitution calls for expansion of the rights of republics and local Soviets of People's Deputies in planning and guiding the economy and in construction of social welfare and cultural facilities in their jurisdictions. The drafting of regional financial balances will help them to exercise those rights.

The higher level of national economic planning and the new capabilities afforded planning by up-to-date computers urgently necessitate a further improvement of the methodology of compiling the financial balance of the national economy and a more complete linkage of financial and physical flows.

The Division of Finance, Prices and Production Cost of USSR Gosplan compiles a summary financial plan of the state which does not include the finances of kolkhozes or consumer and housing construction cooperatives, nor does it include the finances of voluntary public organizations, which is obviously not right.

It is indispensable to reflect this group of financial relations, since the financial resources of society and the state and the corresponding outlays and investments will then be more fully taken into account. This also makes it easier to establish mutual linkage between finance and credit, since the kolkhoz-cooperative sector and public organizations are reflected in the credit and cash plan of Gosbank. This will also make it easier to plan sources of financing for capital investments and for building up working capital in the national economy.

Another reason why the financial balance should reflect the finances of kolkhozes is because the ever greater outlays of the state to develop agriculture should be fully and comprehensively reflected in the process of the financial planning of agriculture as a unified complex so as to take the organizational factor into account (transformation of kolkhozes into sovkhozes, development of interfarm cooperation, etc.).

At the present time a number of economists are working on the problems of planning and linking the material-physical and financial-value aspects of production by means of a number of national economic models, including the financial balance of the national economy.

We should note here the work of a team of scientists of the Sector of National Economic Modelbuilding of the Economics Institute of the USSR Academy of Sciences. Mathematical-economic models have been devised which make provision for the balance and ensure the conditions for the sale and linkage

of final income, on the one hand, and goods and services on the other; moreover, goods and services represent the function of income in much the same way as inputs represent the function of output in the intersector balance.[17]

Models of the summary physical-financial balance of the national economy have been developed in the Central Mathematical-Economics Institute of the USSR Academy of Sciences in which provision is made for solving a number of problems of balancing physical and money flows and balancing the circulation of money as a whole.[18]

Work of this kind has great importance to developing the methodology and theory of the financial balance of the national economy.

FOOTNOTES

1. See, for example: "Ekonomicheskaya statistika" [Economic Statistics], Moscow, Statistika, 1970; "Kurs ekonomicheskoy statistiki" [Course in Economic Statistics], Moscow, Statistika, 1975; Lyando, A. M., "Voprosy finansovogo balansa narodnogo khozyaystva" [Problems of the Financial Balance of the National Economy], Moscow, Gosfinizdat, 1963; Shekhovtsev, G. K., "Svodnoye byudzhetnoye planirovaniye" [Summary Budget Planning], Moscow, Finansy, 1976; Belkin, V., and Ivanter, V., "Financial and Foreign Economic Relations in the National Economy," VOPROSY EKONOMIKI, No 4, 1977; Pavlov, V. S., "Finansovyye plany i balansy v sisteme ekonomicheskogo planirovaniya" [Financial Plans and Balances in the System of Economic Planning], Moscow, Finansy, 1978; Isayev, B. L., "Balansy mezhotraslevykh finansovykh svyazey" [Balances of Intersector Financial Relations], Moscow, Nauka, 1973, and other writings as well.

2. See "Finansy SSSR, " [Soviet Finance], Moscow, Finansy, 1977.

3. See Birman, A. M., "Ocherki teorii sovetskikh finansov" [Essays in the Theory of Soviet Finance], Moscow, Finansy, 1974.

4. See Barkovskiy, N. D., "Problemy kredita i denezhnogo oborota v usloviyakh razvitogo sotsializma" [Problems of Credit and Circulation of Money in the Context of Advanced Socialism], Moscow, Finansy, 1976.

5. As P. Krylov notes, the detailed list of the products of the industrial sector by types and sizes runs to 12 million articles and relations between sectors under present conditions are typified by a high rate of change (see VOPROSY EKONOMIKI, No 1, 1979, p 70).

6. See Volkov, A. M., "Perspektivnoye planirovaniye finansovykh resursov" [Multiannual Planning of Financial Resources], Moscow, Finansy, 1976, p 63.

7. We cannot agree with V. S. Pavlov, who writes: "The question of including the use of the loan fund in the summary financial plan of the state either on the basis of the net results or in detailed form has no importance." (See "Finansovyye plany i balansy v sisteme ekonomicheskogo planirovaniya," Moscow, Finansy, 1978, p 128.)

8. Bogolepov, M. I., "Finansovyy plan pyatiletiya" [The Financial Plan of the Five-Year Period], Moscow, Planovoye Khozyaystvo, 1929, pp 138-139.

9. A. V. Bachurin has emphasized that "the problem is by improving the practice of drafting financial and credit plans to enhance their role in ensuring optimum proportions in the production and distribution of the national income and also in balancing the national economic plan." (Bachurin, A. V., "Planovo-ekonomicheskiye metody upravleniya" [Economic Planning Methods of Management], Moscow, Ekonomika, 1977, p 236).

10. See Markovskiy, N. D., "Problemy kredita i denezhnogo oborota v usloviyakh razvitogo sotsializma," Moscow, Finansy, 1976, pp 148-149.

11. As we know, at the present time emission is taken at zero for the planning year in the balance of personal income and expenditures. It would be better to give up this practice, especially in 5-year plans. This would make requirements more stringent concerning the accuracy of computations of the relevant indicators.

12. See Shekhovtsev, G. K., "Svodnoye byudzhetnoye planirovaniye," Moscow, Finansy, 1976, pp 12-17.

13. The methodology of compiling the planned financial balance first began to be developed in 1927. In March 1928 the All-Union Conference of Planning Officials recommended to Gosplan and the People's Commissariat of Finance, as well as to the gosplans of the union republics, that they work out a method of compiling a planned financial balance (unified financial plan). Later the need to compile a financial balance was confirmed by resolutions of the budget commission and by a session of the USSR Central Executive Committee.

Summary tables of the financial balance and pertinent computations were first submitted to Gosplan and USSR Councils of People's Commissars by the People's Commissariat of Finance in September 1929.

On the basis of extensive discussion of the principal problems of the methodology of compiling the financial balance and experience in drafting it in 1929 and 1930 the USSR Central Executive Committee and Council of People's Commissars adopted a decree on 23 May 1930 whose preamble noted: "The successes achieved in the planned economy make it possible and necessary to raise the planning of finance to a higher level and to embrace the finance of the socialized sector with a unified financial plan. This plan, without eliminating the individual operational

plans (state budget, financial plan of the industrial sector, credit plans, and so on), should facilitate and improve their mutual reconciliation and ensure the most purposive commitment and economical use of resources to meet the needs of the national economy, culture, administration and defense of the USSR."

The transition to compiling the financial balance of the national economy also necessitated improvement of the way financial planning was organized in people's commissariats and enterprises. It was their duty to regularly submit their financial plans to planning and financial authorities, which considerably improved the way financial planning was organized.

14. See FINANSY SSSR, No 10, 1978, p 94.

15. See Shekhovtsev, G. K., "Svodnoye byudzhetnoye planirovaniye," Moscow, Finansy, 1976, p 57.

16. See Barkovskiy, N. D., "The Credit System and Its Impact on Production Efficiency," DEN'GI I KREDIT, No 9, 1978, p 22. Also see Bachurin, A. V., "Planovo-ekonomicheskiye metody upravleniya," Moscow, Ekonomika, 1978.

17. See, for example, the book "Model': 'Dokhod--tovary' i balans narodnogo khozyaystva" [The Income-Commodity Model and the Balance of the National Economy], edited by V. D. Belkin and A. Yu. Geronimus, Moscow, Nauka, 1978.

18. See "Svodnyy material'no-finansovyy balans" [Summary Physical-Financial Balance], edited by B. L. Isayev and A. G. Terushkin, Moscow, Nauka, 1978.

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METHODOLOGY OF LONG-RANGE SAVINGS FORECASTS

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[Article by U. G. Chernyavskiy]

[Text] The rise in the standard of living of the population, accompanied by a high growth rate of personal savings, has intensified interest methodology of forecasting savings. Moreover, as a rule in all the research in the published so far dependencies have been discovered between savings and income and also other factors as well, regression equations are constructed, and the functions obtained are extrapolated over the forecasting period. The longer that period, the more the essential shortcoming of extrapolation is manifested: the conditions of the base period, including the consequences of a disruption of the balance between demand and supply for consumer goods and services, are inevitably carried over to some degree to the period being forecast. At the same time the specific traits of an advanced socialist society over the long range of its gradual movement are not sufficiently taken into account.

Is it impossible to undertake a long-range forecast of personal savings on the basis of the way of life, the pattern of consumption and income and presupposing complete balance between the demand and supply of goods and services? This statement of the problem differs fundamentally from extrapolation. It takes as its point of departure the need to save against expenditures which cannot be made without accumulating money.

Such a forecast can be made on the basis of the data of the optimum budget, which is oriented toward satisfaction of the reasonable needs of fully developed members of socialist society, or it can be based on anticipated future size of income, the distribution of the population with respect to the level of income, expenditures for purposes for which the money is saved, and the size and composition of the population. The methodology of this kind of long-range savings forecast differs considerably from a long-range forecast of consumption, which is one of its prerequisites.

The following methodological requirements have to be met in forecasting savings.

First, all forms of savings have to be examined in their aggregate (deposits, bonds of the 3-percent loan, personal insurance and hoarded savings), since their formation and use can occur in changing proportions of any of these forms.

Second, the fact that a part of the money in the hands of individuals represents savings must be taken into account. The rest represents money in circulation, which is not savings. The size of the money supply is determined by the size of money turnovers and the rate of turnover of money performing its functions as a means of distribution and the means of payment. The size of savings is affected by other factors, which are examined below.

Third, the forecast must be done in per capita terms (with some exceptions), since it is the per capita size of savings that the factors considered affect, or, what is the same thing, we are dealing with the size of savings per member of the family. Only after this magnitude is determined can we move on to total personal savings of the entire country.

Fourth, the distribution of the population with respect to per capita level of income (groups of population with different per capita income are hereafter called economic groups) must be brought in.[1]

This study of personal savings over the long run requires that the following basic problems be solved:

1. Designation within the personal budget of those expenditures for which savings are required over and above current income.

2. Determination of the per capita annual expenditure for these purposes in each economic group.

3. Adoption of assumptions concerning how long money is accumulated for expenditures of this kind.

4. Assessment of not only that portion of savings which individuals use in the year of the long-term period being forecast, but also of total savings at the beginning of the year, including savings to be spent in subsequent years.

The principal purposes for which savings are used are reflected in a list like the following: purchase of expensive durable consumer goods and expensive articles of clothing; expenditures for annual vacations; expenditures for construction (aside from outlays for current repairs); original contributions to housing construction cooperatives; savings intended for use after retirement as a supplement to the pension, and also savings to provide for children.

As for the first three purposes, sources of information on average per capita expenditures are forecast for that year of the long-term period for

which the savings forecast is being made, for example, for 1990 or a more remote year of the long-term period.

Assessment of initial contributions by individuals to housing construction cooperatives depends on the long-range conception adopted concerning supply of housing and which personal funds are to be used for that purpose. Differing opinions have been expressed on this question.

In our calculation, which was done in the middle of the Ninth Five-Year Plan and oriented toward 1990, we adopted the working projection of USSR Gosplan concerning the planned volume of housing to be completed in that year of the long-term period and the average cost per square meter. It was assumed that a certain share of the housing completed would be supplied to individuals on the basis of their having previously paid a part of its cost. Other approaches are also possible, but they must still make an assumption concerning long-range social and economic policy in this domain.

In addition to using data of long-term forecasts, we must also make certain assumptions to calculate the savings intended for use after retirement. The quantities obtained from forecasts are the amount of the average wage and distribution of the population with respect to the level of per capita income. We adopt the assumption that after retirement savings will be a supplement to the pension that represents a certain percentage of earnings before retirement. In this connection we take into account that only that portion of the families who have had a sufficient income could have built up savings of this kind for a number of years before retirement. The dynamic behavior of the age-specific and sex-specific composition of savings depositors can shed some light on the savings held by retired persons and the savings built up just before retirement.[2] In view of the high growth rate of savings by these categories of depositors and the socioeconomic significance of this process, it is advisable to distinguish retired persons recorded by savings banks (they are now put in the same group with students and other depositors who do not indicate their social status) and those holding life insurance. The social status of the depositor is recorded only once, when the account is opened. Yet it changes as time passes. Students, for instance, enter the category of workers or employees, and workers and employees become retired persons, and so on. It therefore seems advisable to update this information and also to record social status in a more detailed grouping, which will expand the opportunities for analyzing balances.

When a given per capita expenditure is broken down by economic groups, the amount of savings of the entire population is dependent upon our assumption as to how long money is saved for particular purposes.

We will illustrate the methodology for computing savings with the example of financing expenditures to purchase durable consumer goods. The calculation must pertain not to any particular commodity, but to the set of expensive durables. As a matter of fact, once a particularly commodity has been purchased, the family does not immediately begin to accumulate money to buy the

same article in the year when it wears out. Money will be set aside to purchase other commodities. We will assume that the average service life of the entire set of durables is 15 years for a particular economic group. The family does not buy the entire set of durables all at once, but spends its savings in several partial outlays within that period. Unfortunately, statistics do not afford any data for expert evaluation of the average frequency of purchases within an average 15-year period.

At the present time groups of commodities including durables cover accompanying goods and repair which do not require savings. For instance, radio equipment includes radio tubes, accessories for radio equipment, spare parts, batteries, and so on; the group of miscellaneous recreation goods includes along with cameras and movie cameras photographic plates, photographic film, movie film, and other photographic equipment. The time has come to break the statistics down into three parts: durables, accompanying goods and repair. This separate accounting is needed not only to forecast savings, but also to estimate personal property and for forecasting the demand for durables.

Assuming this change is made, the reference for answering the question of the average frequency with which durables are purchased can be given by the grouping of annual family budgets with respect to the criterion of whether or not an expenditure has been made to purchase them. For each economic group one ascertains that lower value of durables at which the family begins to use savings. The share of families spending savings to purchase durables, we assume, is one-fifth of the particular economic group of the population. This means that in any economic group such purchases occur once every 5 years. Establishing the share of families spending funds for durables and the trends of this indicator over a number of years would make it possible to undertake an expert evaluation of the frequency of their purchase. Thus the share of families and sum total of purchases are established variously for budgets with differing level of per capita income and separate moreover for workers, employees and kolkhoz members. The resulting indicator of the frequency of purchases is adjusted on the basis of the distribution of the population with respect to the level of per capita income and social status. Of course, the program for working this out must be thoroughly thought through with the help of the interested organizations, and the same applies to the conclusions drawn from it.

We will continue our example for a social group of the population with a particular interval of per capita income for which we have found that durables are purchased with savings once every 5 years. We will assume that the expenditure for this group in the year being forecast is equal to 2,000 rubles per family. Assuming average family size (four members), the per capita expenditure is 500 rubles, including 100 rubles from current income (since the purchase is made once every 5 years), while 400 rubles come from savings. These 100 rubles are provided for in the planned personal budget for the year of the forecast. What ought to be the amount of savings at the beginning of the year being forecast, say 1990, so that in that year one-fifth

of the population included in the socioeconomic group and in the four succeeding years the rest of the population in that group can make such a purchase once every 5 years?

Assuming a frequency of purchases of once every 5 years, the share of the population which acquired a durable 5 years before, i.e., in 1985, as we have noted, will spend 500 rubles to purchase them in 1990. In doing so they take 400 rubles from savings. The accumulation of one-fifth of the entire Soviet population will be 80 rubles in per capita terms at the beginning of 1990 (400:5).

But in addition to the accumulation of that portion of the population which will make a purchase in 1990, at the beginning of the year there must also be savings of those individuals who acquired a durable after 1985, in the subsequent 3 years--1986, 1987 and 1988. The per capita amount of savings of the entire population in this group drops to 20 rubles for each purchasing year after 1985 (see Column 3 in the table).

Illustrative Computation of Savings Required at the Beginning of 1990 To Acquire Durables Assuming the Durables Are Purchased Once Every Five Years

	Savings at Beginning of 1990 (rubles)	
Year of Last Purchase of a Durable	In Per Capita Terms for One-Fifth of Population Included in Group	In Per Capita Terms for the Entire Population in Group
1	2	3
1989	--	--
1988	100	20
1987	200	40
1986	300	69
1985	400	80

No savings are required at the beginning of 1990 for that portion of the population which purchased durables in 1989, since it will begin to set money aside in 1990.

The per capita amount of savings for the entire population included in the particular socioeconomic group, which is given in Column 3, yields a result of 200 rubles, which is twice the amount of the annual expenditure provided for in the budget on a per capita basis for the entire population in the group. In other words, the savings needed at the beginning of 1990 are twice as great as the per capita expenditure in that year to purchase durables for the entire population in the group.

In accordance with these considerations we propose the following formula for calculating the size of savings at the beginning of 1990 in per capita terms for each socioeconomic group:

$$E \times ([T - 1]/2) = S, \quad (1)$$

in which E--annual expenditure for consumer goods in 1990 in per capita terms for the entire population in the group (in rubles);
T--interval at which the expenditure is made (in years);
S--savings at the beginning of the year (in rubles).

Substituting the figures of our example, we get:

$100 \times ([5 - 1]/2) = 100 \times 2 = 200$ rubles.

Assuming an average interval for purchase of durables of, say, once every 8 years, we get:

$100 \times ([8 - 1]/2) = 100 \times 3.5 = 350$ rubles,

i.e., per capita savings at the beginning of the year for the entire population will exceed by 3.5-fold the annual per capita expenditure to purchase durables envisaged in the family budget. The excess of savings over the annual expenditure to purchase durables will increase directly with the length of the average interval between purchases.[3]

The sum total of savings of the entire Soviet population to purchase durables is determined on the basis of the per capita amount of savings and the size of the population at the beginning of the forecasting year, 1990, in each socioeconomic group. The growth of savings in that year is determined by the growth of the per capita expenditure for those needs for which money is saved (in this example to purchase durables), and by the increase in the size of the population in the year being forecast.

In the calculation for 1990 we mentioned the largest savings were to purchase durables and to supplement pensions following retirement. Savings for the latter purpose considerably surpass all others with respect to their growth rate up to 1990.

We assumed in the calculation that the frequency of purchases of durables would be affected by factors operative in the opposite direction. The average interval between purchases would tend to be increased by an increase in the share of expensive articles in the set of durables and also by a high level of saturation of durables so that the original demand for them (as distinguished from demand for replacement) will have a smaller share in the purchases. But factors tending to reduce the average intervals between purchases will win out: the rise of per capita income, expansion of the set of durables, elimination of shortages of goods, intensive renewal of the assortment under the impact of scientific-technical progress, and further improvement of housing conditions.

Savings to supplement pensions will increase at a particularly high rate because of the impact of the rise of per capita income and the related increase in the share of the population setting aside funds for that purpose.

The method we propose makes it possible to distinguish the principal purposes for which savings are used, which is important in arriving at a socio-economic description of them. It shows clearly that when balance is achieved between the supply of and demand for goods and services, the need for saving results from regular processes of the growth of personal consumption and the way of life in an advanced socialist society. The basic contrast in the purposes for which individuals use their savings in socialist and capitalist countries lies in the fact that in socialism they cannot be spent for entrepreneurial purposes, and savings for unforeseen events have a secondary role. In capitalist society, however, this is the most frequent reason why the working population saves money.[4]

Eliminating shortages of goods and services and improving relations in distribution are the principal prerequisites for compensating savings in the hands of those who need them to satisfy the rational requirements of members of an advanced socialist society. Shifts will take place in the relative standing of the various forms of savings: there will be a drop in the share of cash savings and an increase in institutional savings.

Selling goods on credit makes it less necessary for people to save. This is a means which makes it possible for population groups with lower per capita income to increase their supply of durables and comparatively expensive articles of clothing. This is the principal social role of selling goods on credit in advanced socialist society.

If the method proposed is used, the error resulting from the assumptions adopted will have a greater effect on the results of savings and a lesser effect on their increments, since possible errors in calculations for particular years are accumulated in the results. Assuming we have calculations for a number of years built on one and the same assumptions, we can obtain a reading of important processes in the field we are studying. At the same time these calculations can provide material on a dynamic basis for correction of the assumptions that were made.

There is an interest in retrospective computations for past years done by this method. Such calculations have shown that actual savings exceed the calculated savings. This excess can only partially be attributed to unsatisfied demand. The point is that there is a portion of savings which cannot be drawn into sales turnover or the service sector even if the balance of supply and demand is ideal. This portion of savings is accounted for by two groups: the group with a high level of need but with such high income that even its high needs have already been fully satisfied; the group which does not have a high enough level of need and does not spend all its money income to purchase goods or pay for services, since these needs are fully satisfied.

Such savings "do not exert pressure" on the market, since they actually do not take part in circulation. But they might become active when they pass into the hands of heirs. An estimate can obviously be made of the amount of savings not drawn into calculation only by expert evaluation on the basis of an analysis of the comparatively large inactive savings.

Improvement of the statistical base concerning durables and concerning savings of persons of prepensionable and pensionable age are prerequisites for making sound calculations according to this method. The soundness of the assumptions made can be improved by surveys of the population; experience in conducting these is available in a number of socialist and capitalist countries.

Thus the method we propose for long-range forecasting of personal savings results in an estimate of their total volume in all forms in the aggregate and is objectively conditioned by development of a mature socialist society.[5] Determining the growth of objectively determined savings in per capita terms, this method also makes it possible to provide an optimum budget for funds to increase savings above and beyond current expenditures; this element is an inseparable part of the budget. The approach we have proposed is one of the ways of studying savings, of analyzing their composition with respect to purpose, of looking more closely at their socioeconomic role, at discovering the dynamics of their deviations from the objectively conditioned amount, i.e., from the need for savings in an advanced socialist society. Consequently, use of this method provides a criterion concerning the proportionality of processes in the field being studied and of their correspondence to the conditions of the country's economic development. This kind of proportionality is an essential element in the efficiency of the economy, whose improvement was the aim of the decisions of the 25th CPSU Congress.

We must emphasize that to study the complicated processes of the formation of the savings it is usual to combine various methods (including retrospective calculations) and to compare the results of their use. This is all the more important because there are hypothetical assumptions and debatable points in all the approaches to the study of savings.

FOOTNOTES

1. Meeting these methodological requirements is also necessary in establishing the correlation, as we have said above. But they are violated because the researchers lacked the necessary information, and in our view there are shortcomings in the methodology. To be specific, it does not seem legitimate to estimate unsatisfied demand based on studying just one form of savings--accounts in savings banks, whose share in the total amount of savings varies from year to year. Moreover, in the various regions of the country there are great differences in the proportions between the forms of savings. Consequently, shifts in the geographic distribution of savings also affect the share of savings accounts in them.

2. See DEN'GI I KREDIT, No 4, 1975, p 69.

3. Formula (1) is suitable for calculating savings for the first three purposes, i.e., when the personal budget--planned and optimum--includes the

total annual expenditure for these purposes. Calculating savings for initial contributions to housing construction cooperatives (or some other form whereby personal funds are invested in housing construction), not provided for in the budget, is done by correcting the formula:

$$E \times ([T + 1]/2) = S, \qquad (2)$$

in which the same notation is used as in formula (1). The corrected formula increases the need for savings by the amount of the per capita annual expenditure, since this expenditure is not provided for in the current budget.

4. See Fedorov, V. N., "Lichnoye potrebleniye v FRG: sotsial'naya differentsiatsiya, dinamika, struktura" [Personal Consumption in the FRG: Social Differentiation, Dynamics and Structure], Moscow, Nauka, 1974, pp 167-168.

5. Sizable strata of the population do not fix the specific goals of savings. There can also be a change in the purpose of savings. This does not diminish the importance of the method we have proposed. After all, the objective impact on savings is not determined by the goals conceived by persons saving their income, but by the needs for savings for particular expenditures, whose proportion in the future will be known by socialist society and the state representing it by means of the national economic forecast.

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